Εθνικό Μετσόβιο Πολυτεχνείο

Σχολή Πολιτικών Μηχανικών

Υπερπληθυσμός και περιβαλλοντικός ντετερμινισμός

Παρουσίαση βασισμένη στο paper: Sargentis, G.-F.; Koutsoyiannis, D.; Angelakis, A.; Christy, J.; Tsonis, A.A. Environmental Determinism vs. Social Dynamics: Prehistorical and Historical Examples. World 2022, 3, 357-388. https://doi.org/10.3390/world3020020

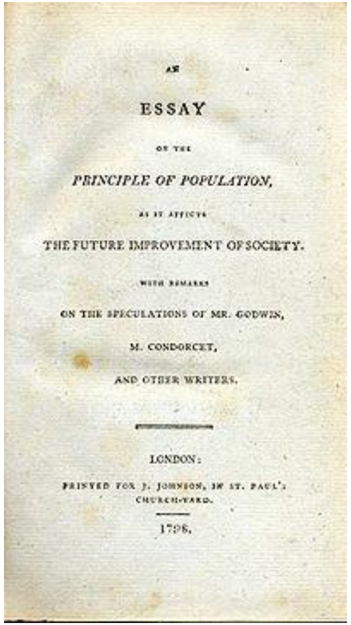
Ν. Μαμάσης και Γ.-Φοίβος Σαργέντης

Παρουσίαση: https://youtu.be/gPlPQv9tOJ4

Δεκέμβριος 2023

Υπερπληθυσμός & περιβαλλοντικός ντετερμινισμός

Thomas Robert Malthus (1766 –1834)



AN

ESSAY

ON THE

PRINCIPLE OF POPULATION,

AS IT AFFECTS

THE FUTURE IMPROVEMENT OF SOCIETY.

WITH REMARKS

ON THE SPECULATIONS OF MR. GODWIN,

M. CONDORCET,

AND OTHER WRITERS.

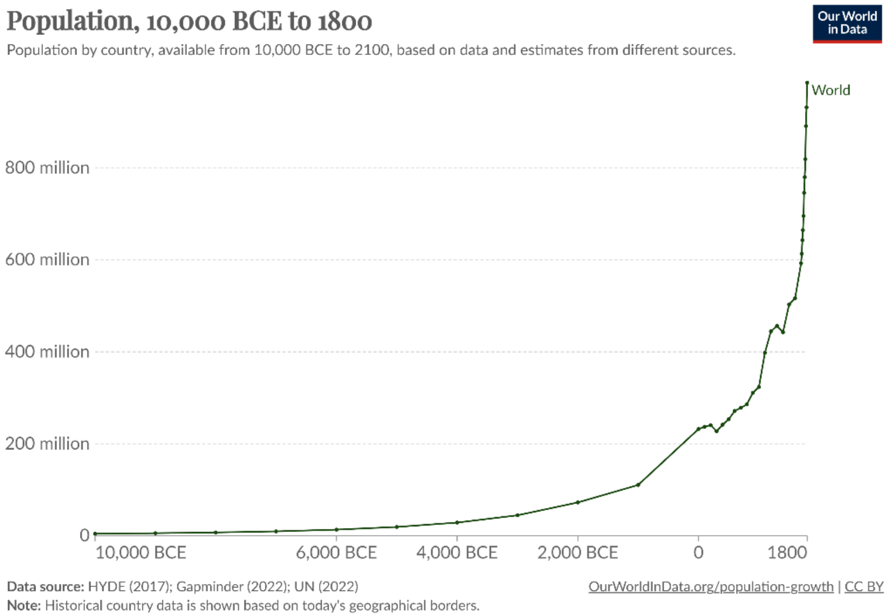
LONDON:

PRINTED FOR J. JOHNSON, IN ST. PAUL'S CHURCH-YARD.

1798.

Malthus, T.R. An Essay on the Principle of Population; J. Johnson: London, UK, 1798.

Πηγή: https://ourworldindata.org/world-population-growth



10000 π.Χ.

476 μ.Χ

1789 μ.Χ.

3 εκ. χρόνια πριν

3000 π.Χ

Έτος 1

1492 μ.Χ.

σήμερα

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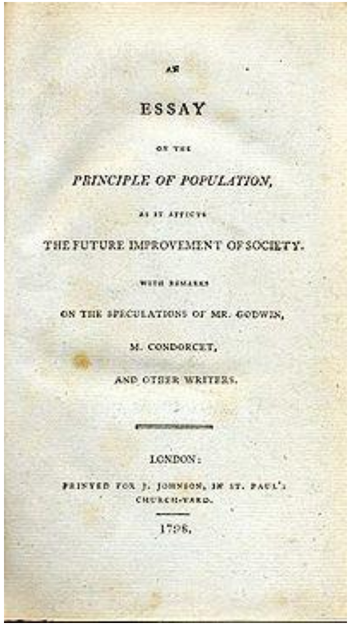

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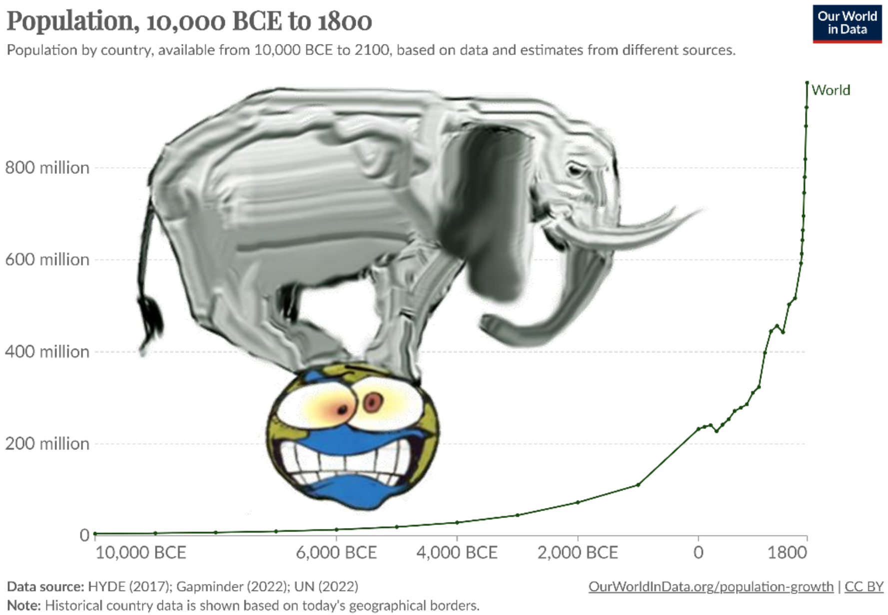

3 εκ. χρόνια πριν · 10000 π.Χ. · 3000 π.Χ · Έτος 1 · 476 μ.Χ · 1492 μ.Χ. · 178 μ.Χ. · σήμερα

Υπερπληθυσμός & περιβαλλοντικός ντετερμινισμός

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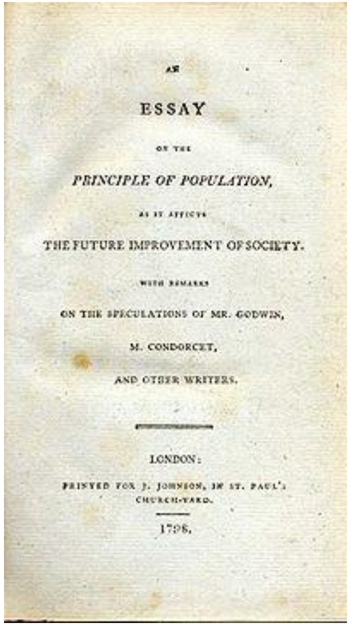

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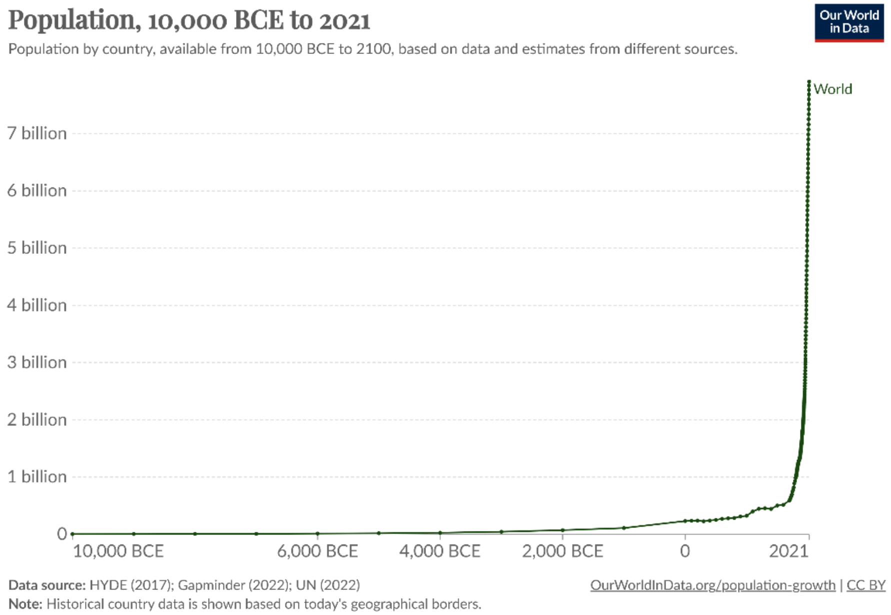
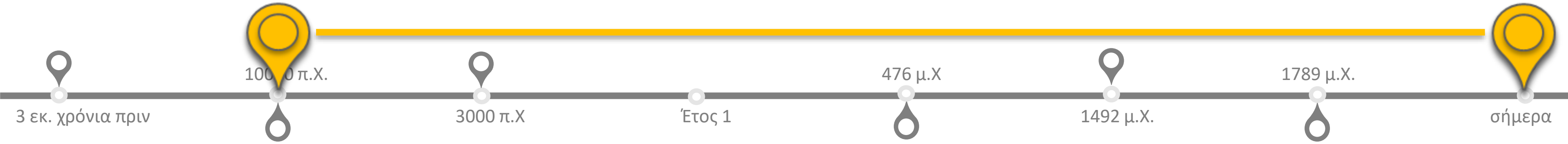
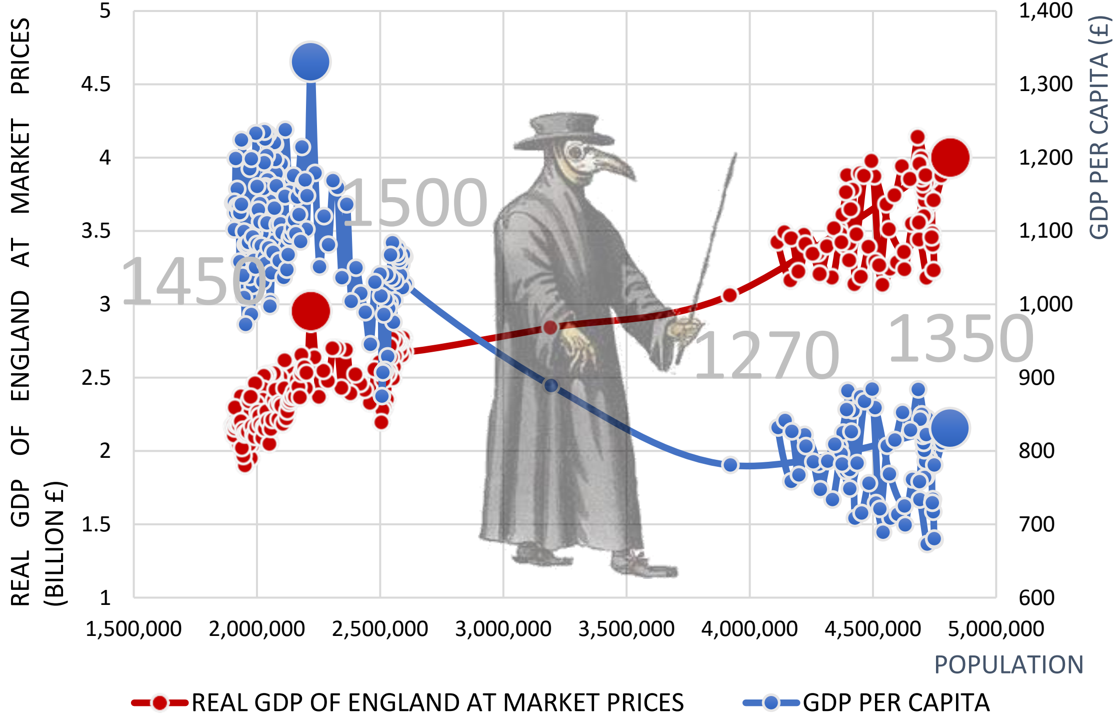
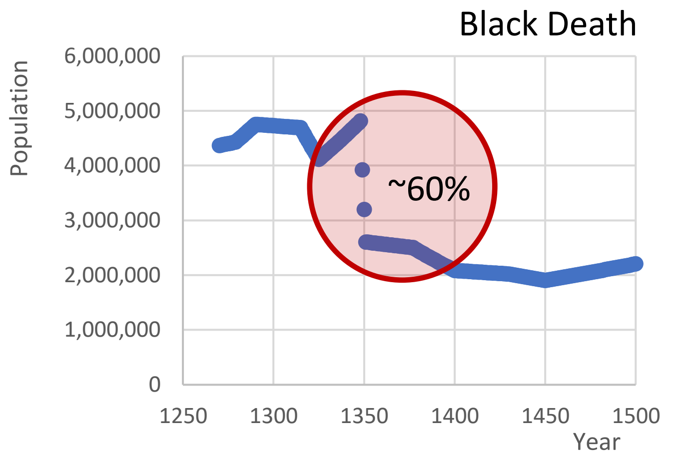


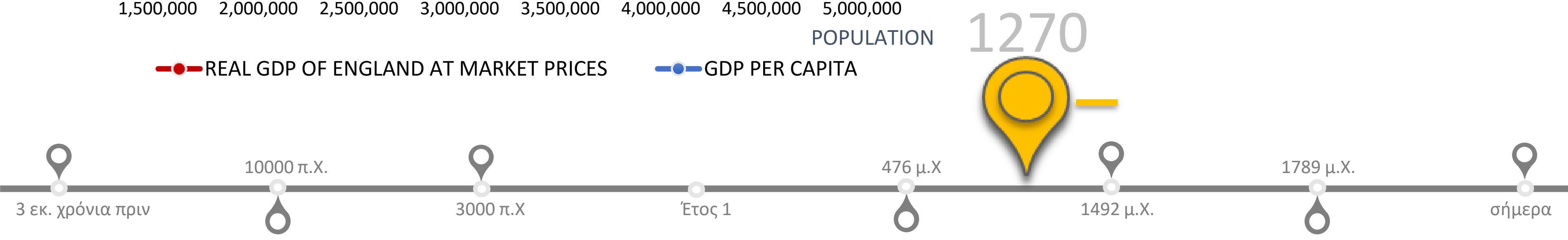


Η Μαλθουσιανή παγίδα

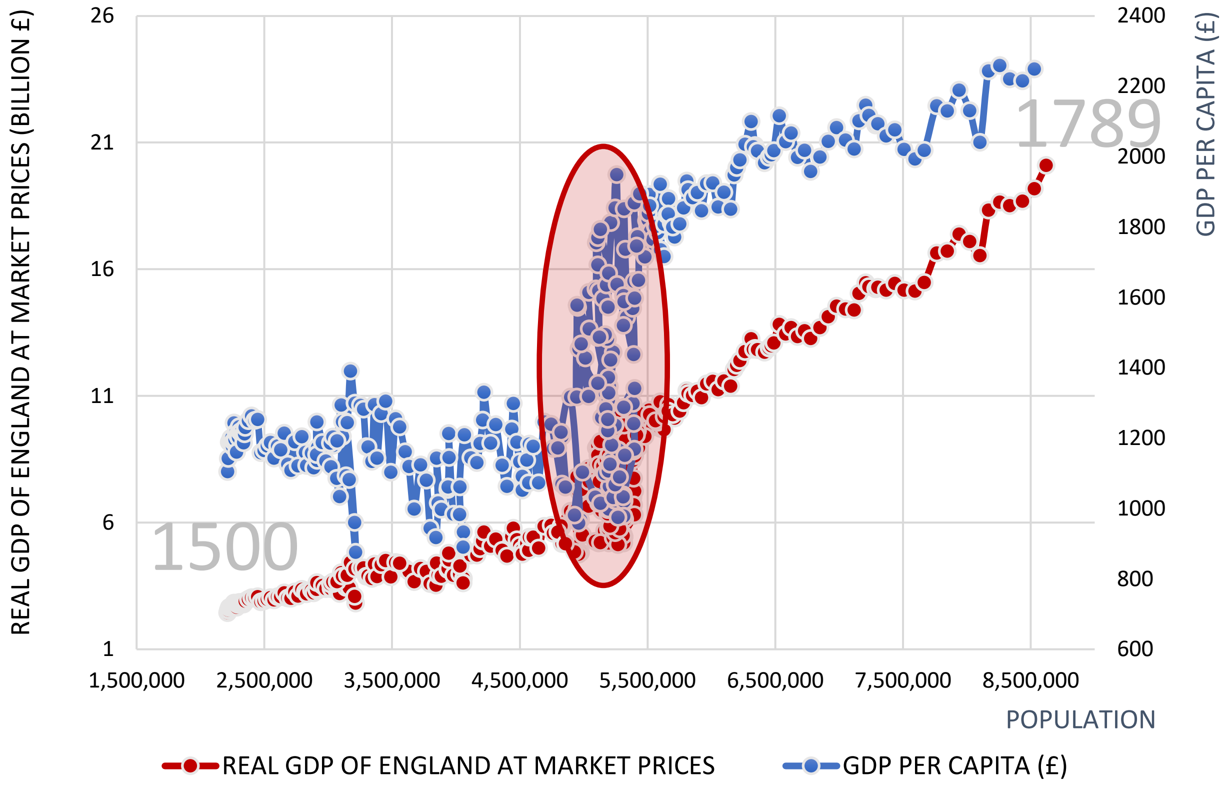




Πηγή: https://www.bankofengland.co.uk/statistics/research-datasets



Μήπως ξεφύγαμε από τις Μαλθουσιανές παγίδες?



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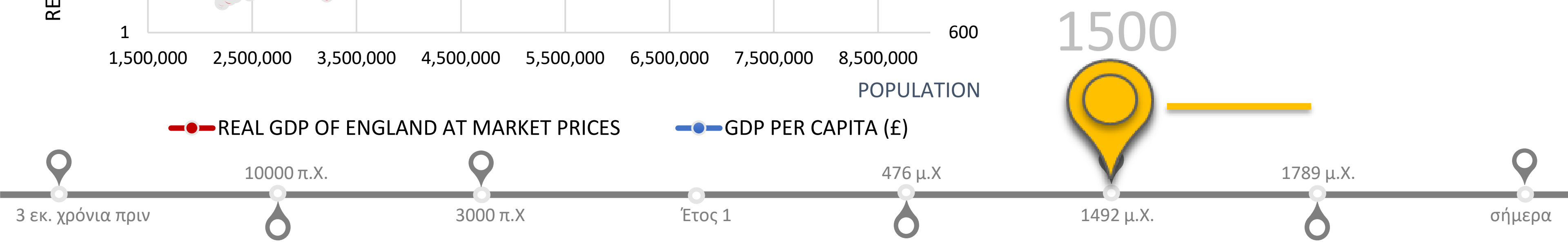
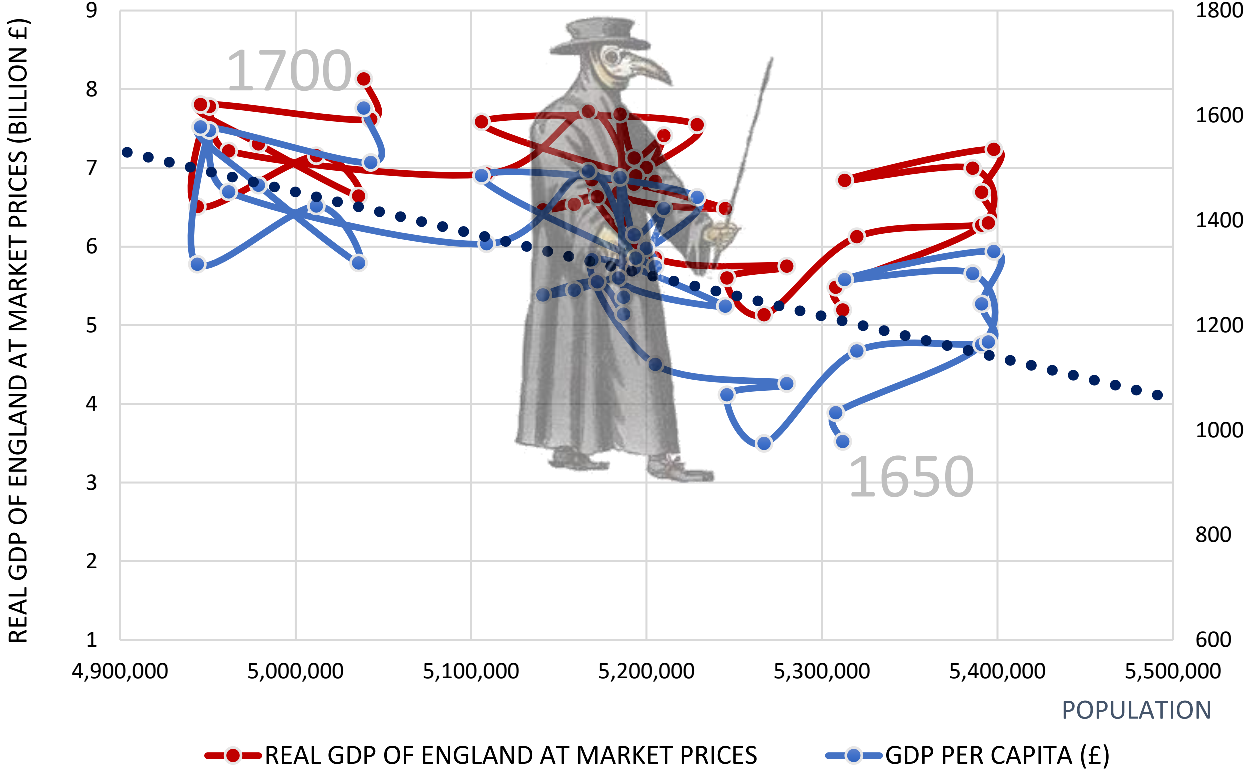
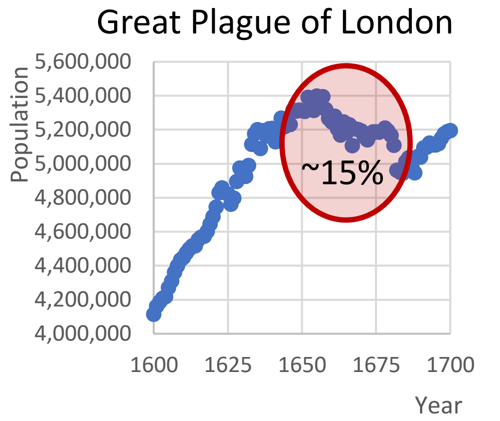


Μαλθουσιανή παγίδα και πάλι!





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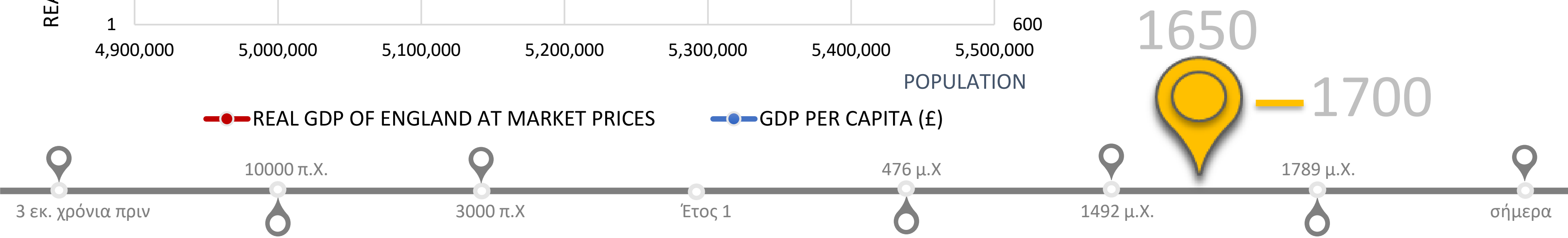
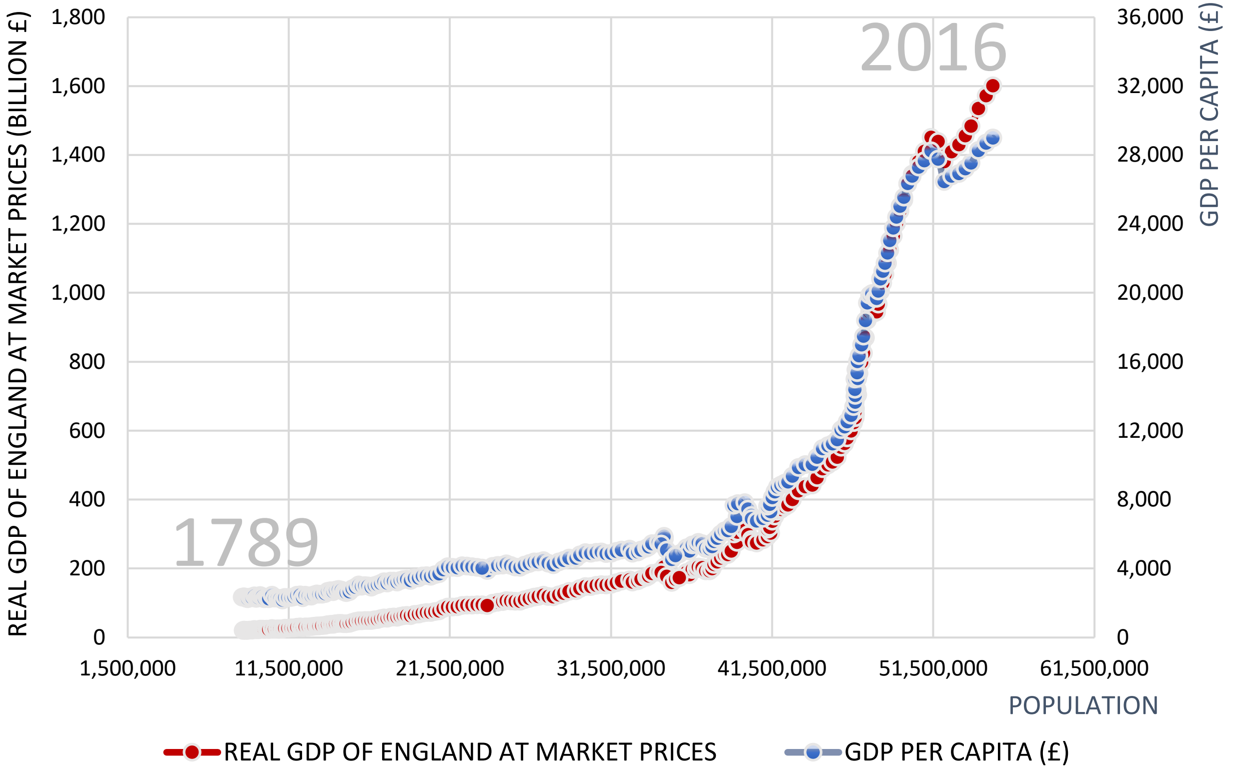
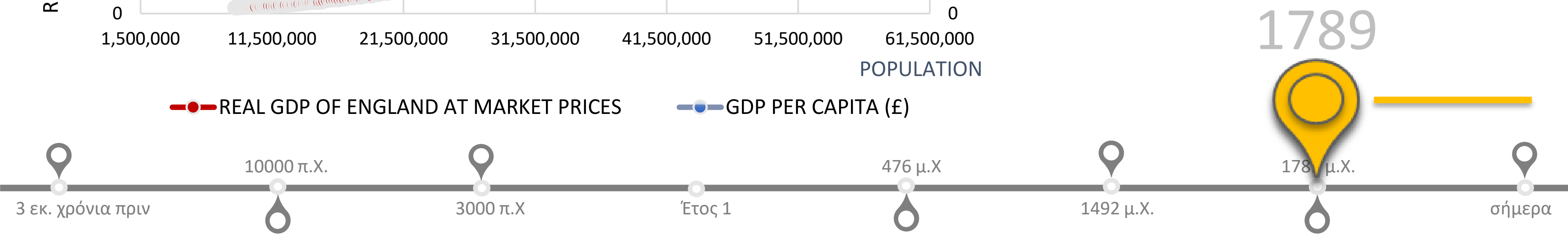


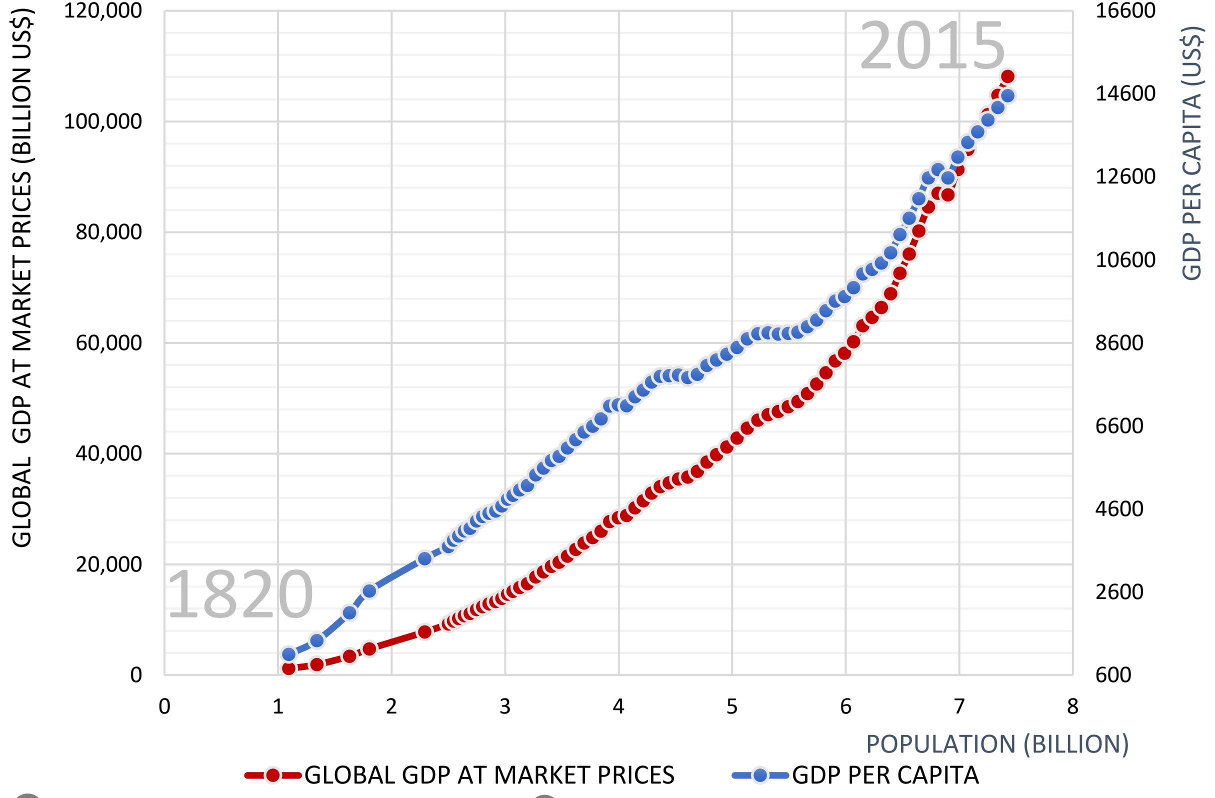
Η ανατροπή της Μαλθουσιανής παγίδας



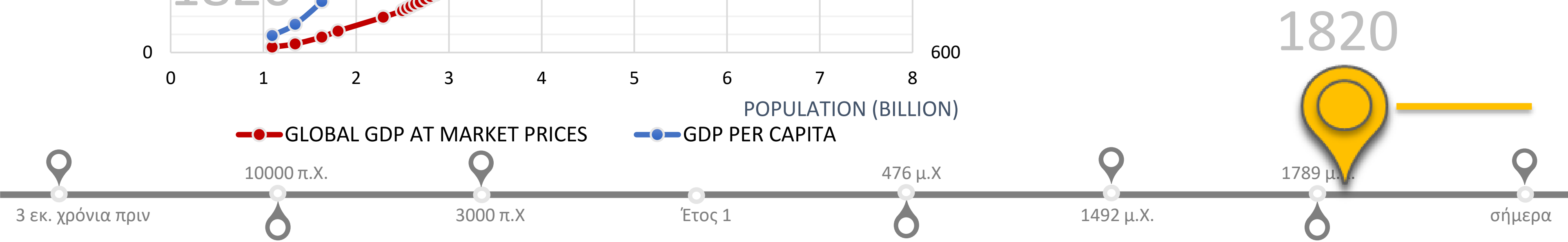
Πηγή: https://www.bankofengland.co.uk/statistics/research-datasets



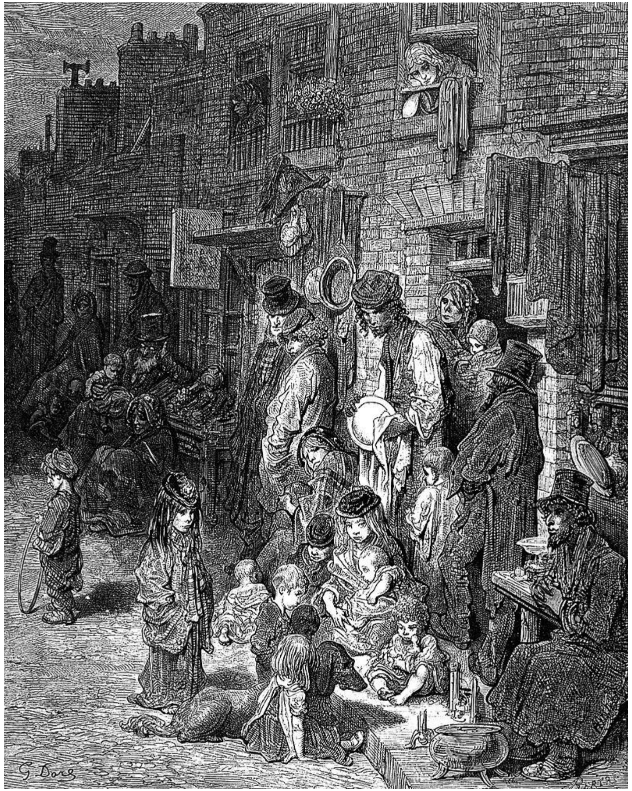
Η ανατροπή της Μαλθουσιανής παγίδας



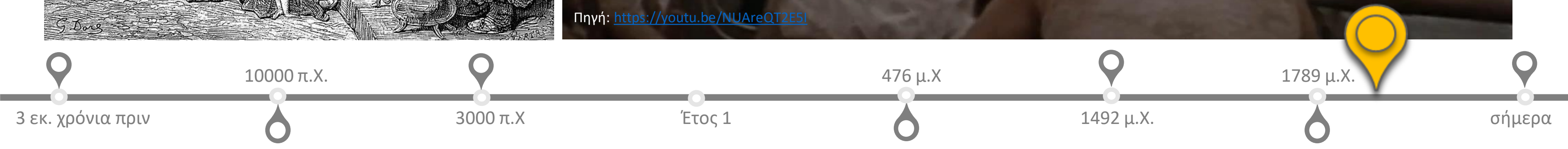
Πηγές: https://ourworldindata.org/economic-growth
https://ourworldindata.org/world-population-growth



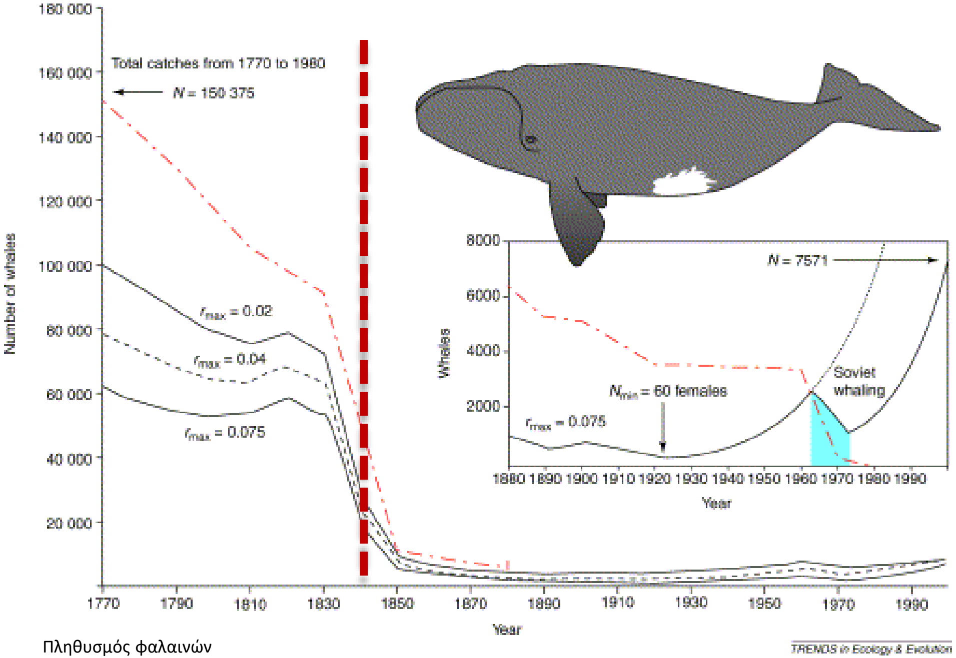
Πως έσπασε η Μαλθουσιανή παγίδα_1



Πηγή: https://youtu.be/NUAreQT2E5I

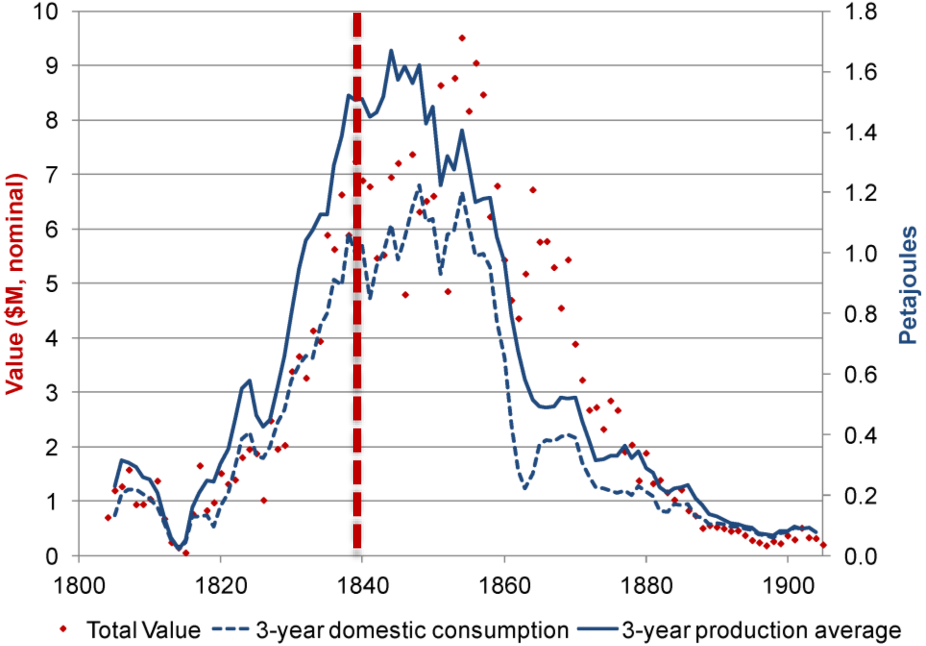


Πως έσπασε η Μαλθουσιανή παγίδα_1



Πληθυσμός φαλαινών

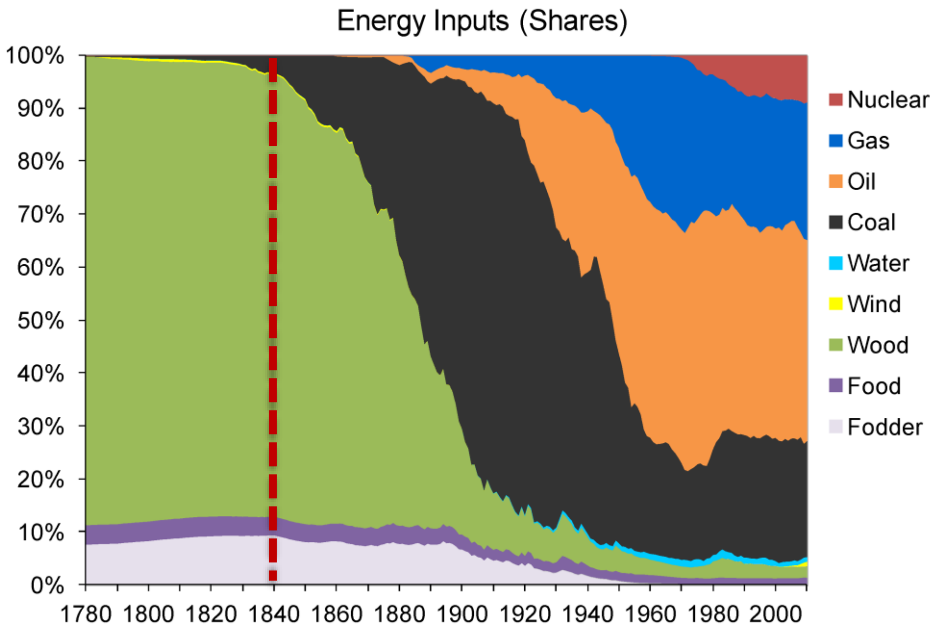
Πηγή: C. Scott Baker, Phillip J. Clapham, Modelling the past and future of whales and whaling, Trends in Ecology & Evolution, Volume 19, Issue 7, 2004,

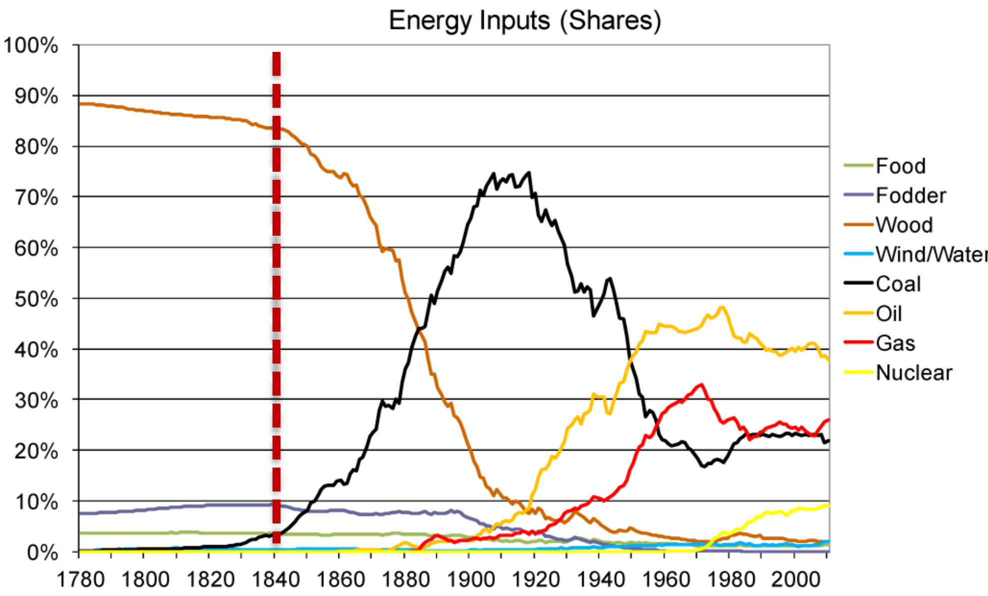


Λάδι φάλαινας, παραγωγή, κατανάλωση και τιμή

Πηγή: O'Connor, P.A.; Cleveland, C.J. U.S. Energy Transitions 1780–2010. Energies 2014, 7, 7955-7993. https://doi.org/10.3390/en7127955

Πως έσπασε η Μαλθουσιανή παγίδα_1





Πηγή: O'Connor, P.A.; Cleveland, C.J. U.S. Energy Transitions 1780–2010. Energies 2014, 7, 7955-7993.
https://doi.org/10.3390/en7127955

Πως έσπασε η Μαλθουσιανή παγίδα_2

Πηγές:

1. Chiu, I. The Evolution from Horse to Automobile: a Comparative International Study. Cambria Press, New York 2008.
2. Levitt, S. D.; Dubner, S. J. Superfreakonomics. Allen Lane, London 2010.
3. Brandon, K. Did Cars Save Our Cities From Horses – Issue 7: Waste. Nautilus, 7 Nov. 2013, Available online: https://nautil.us/did-cars-save-our-cities-from-horses-234625/
4. https://youtu.be/v-5Ts_i164c; https://youtu.be/FeAhVq_dB3A

3 εκ. χρόνια πριν

10000 π.Χ.

3000 π.Χ

Έτος 1

476 μ.Χ

1492 μ.Χ.

1789 μ.Χ.

σήμερα

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Πηγές:
1. Chiu, I. The Evolution from Horse to Automobile: a Comparative International Study. Cambria Press, New York 2008.
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4. https://youtu.be/v-5Ts_i164c; https://youtu.be/FeAhVq_dB3A

~1900

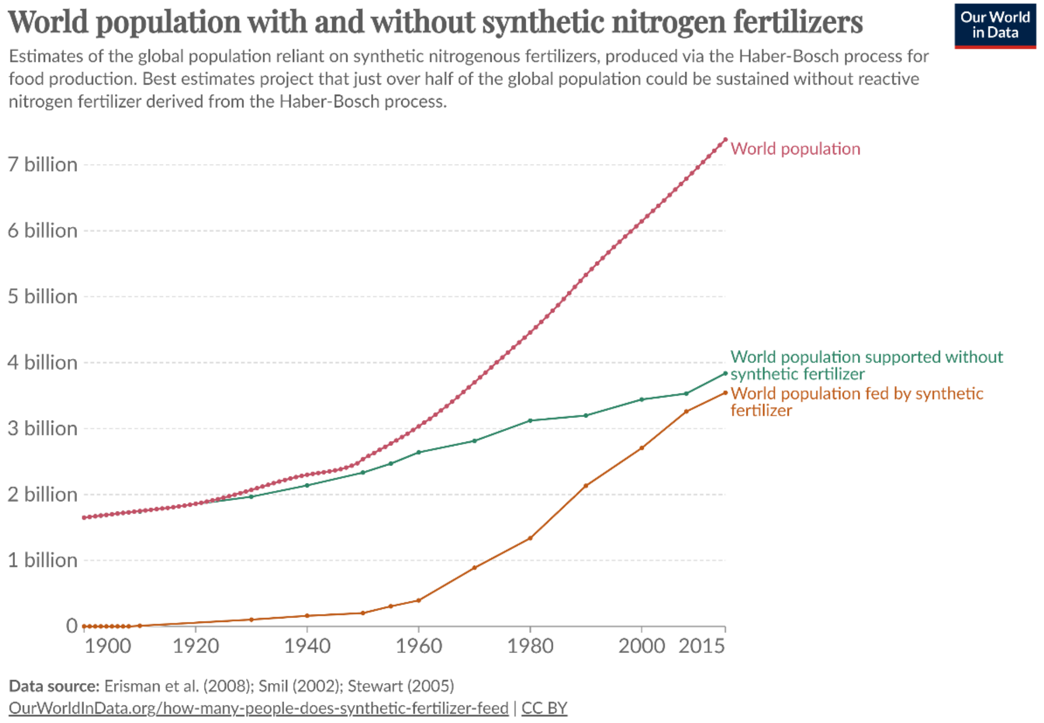
Πως έσπασε η Μαλθουσιανή παγίδα_2

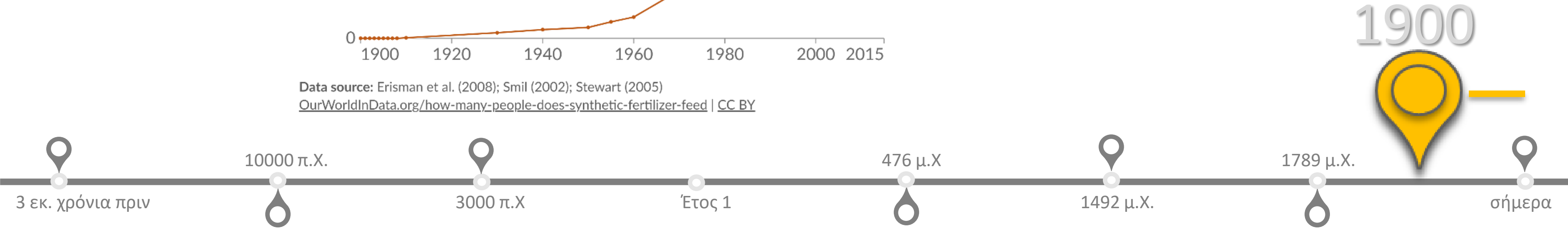
Πηγή: https://youtu.be/c8ObnK8RSU0

3 εκ. χρόνια πριν
10000 π.Χ.
3000 π.Χ
Έτος 1
476 μ.Χ
1492 μ.Χ.
1789 μ.Χ.
σήμερα

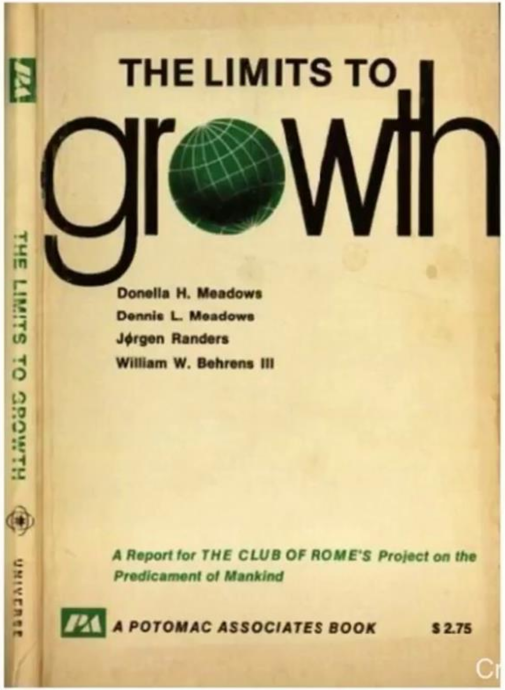
Πως έσπασε η Μαλθουσιανή παγίδα_3

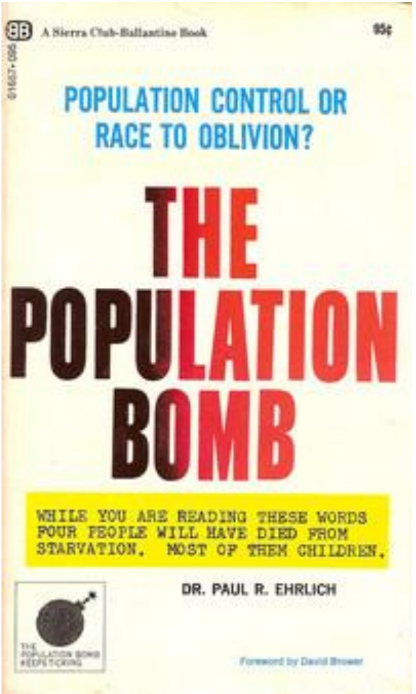
Πηγή: https://ourworldindata.org/grapher/world-population-with-and-without-fertilizer





Πως έσπασε η Μαλθουσιανή παγίδα_4





1. Meadows, D. H., Meadows, D. L., Randers, J., Behrens W.W. III. The Limits to Growth, A Report for the CLUB OF ROME'S Project of the predicament of Mankind, Universe Books, 1972. Available online http://www.donellameadows.org/wp-content/userfiles/Limits-to-Growth-digital-scan-version.pdf

2. Ehrlich, P. R. The population bomb, Sierra Club/Ballantine Books, New York, 1968.

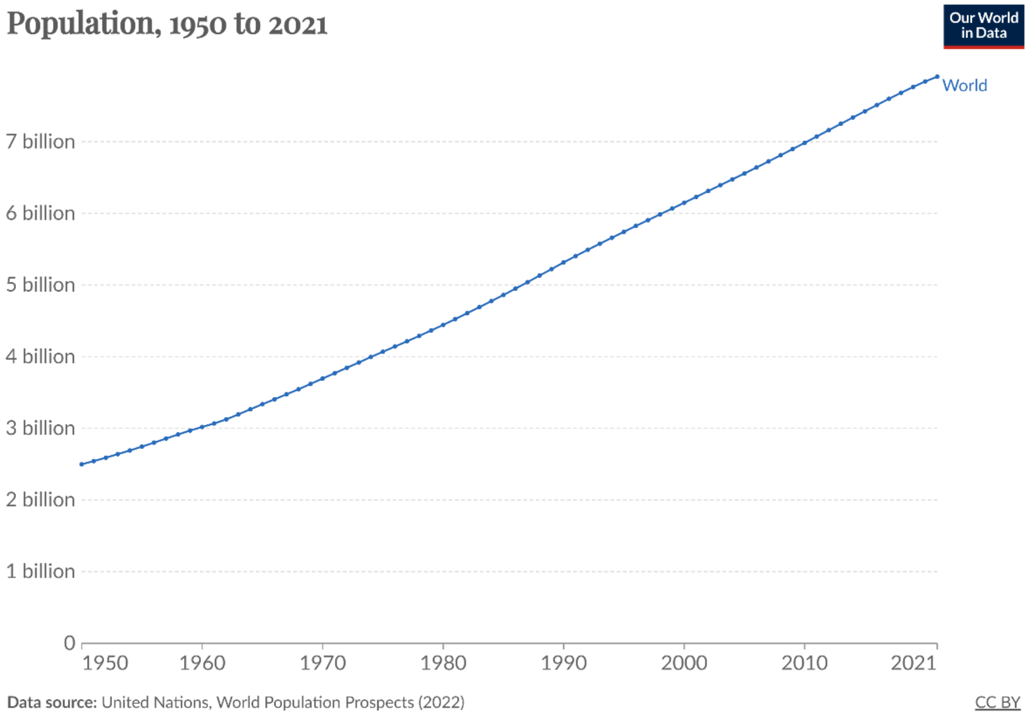
Norman Borlaug «Πράσινη επανάσταση»

~1950

10000 π.Χ. | 476 μ.Χ | 1789 μ.Χ.

3 εκ. χρόνια πριν | 3000 π.Χ | Έτος 1 | 1492 μ.Χ. | σήμερα

Πως έσπασε η Μαλθουσιανή παγίδα_4

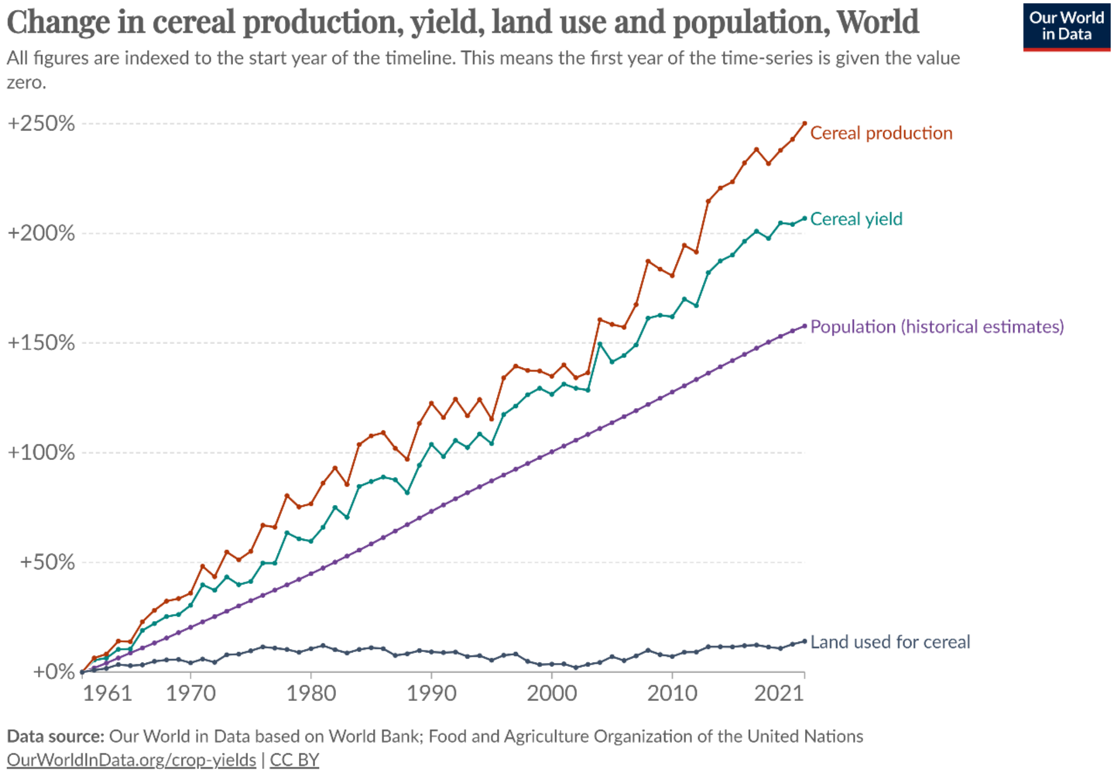


Πηγή: https://ourworldindata.org/grapher/population

1961

3 εκ. χρόνια πριν
10000 π.Χ.
3000 π.Χ
Έτος 1
476 μ.Χ
1492 μ.Χ.
1789 μ.Χ.
σήμερα

Πως έσπασε η Μαλθουσιανή παγίδα_4



Πηγή:
https://ourworldindata.org/yields-vs-land-use-how-has-the-world-produced-enough-food-for-a-growing-population

1961

10000 π.Χ. 476 μ.Χ 1789 μ.Χ.

3 εκ. χρόνια πριν 3000 π.Χ Έτος 1 1492 μ.Χ. σήμερα

Η αποτυχία της Μαλθουσιανής σκέψης

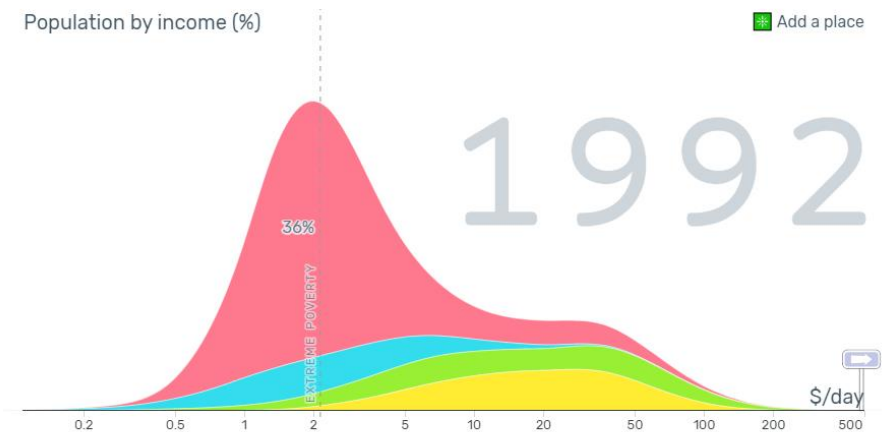
1992 Διακήρυξη του ΟΗΕ στο Ρίο της Βραζιλίας «Η ανθρωπότητα βρίσκεται αντιμέτωπη με την διαιώνιση των ανισοτήτων, την επιδείνωση της φτώχειας, των ασθενειών και του αναλφαβητισμού».

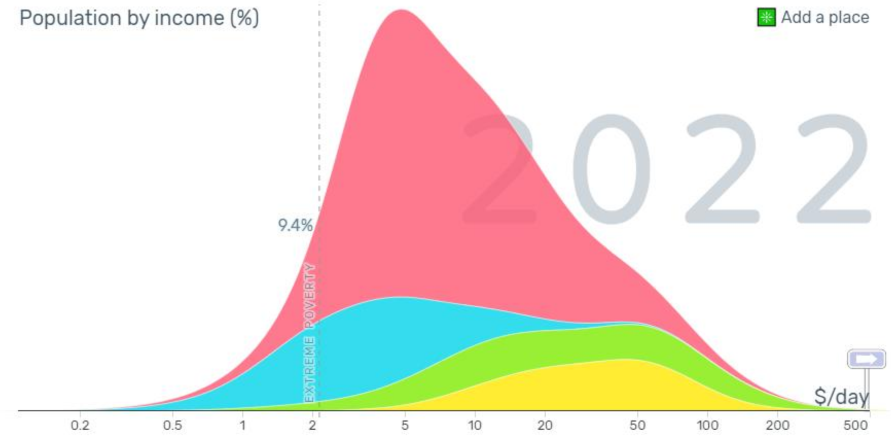
Πηγή: Earth Summit In Rio De Janeiro, Brazil On June 02, 1992.BRAZIL (Photo by Antonio RIBEIRO/Gamma-Rapho via Getty Images)

1992

3 εκ. χρόνια πριν · 10000 π.Χ. · 3000 π.Χ · Έτος 1 · 476 μ.Χ · 1492 μ.Χ. · 1789 μ.Χ. · σήμερα

Η αποτυχία της Μαλθουσιανής σκέψης

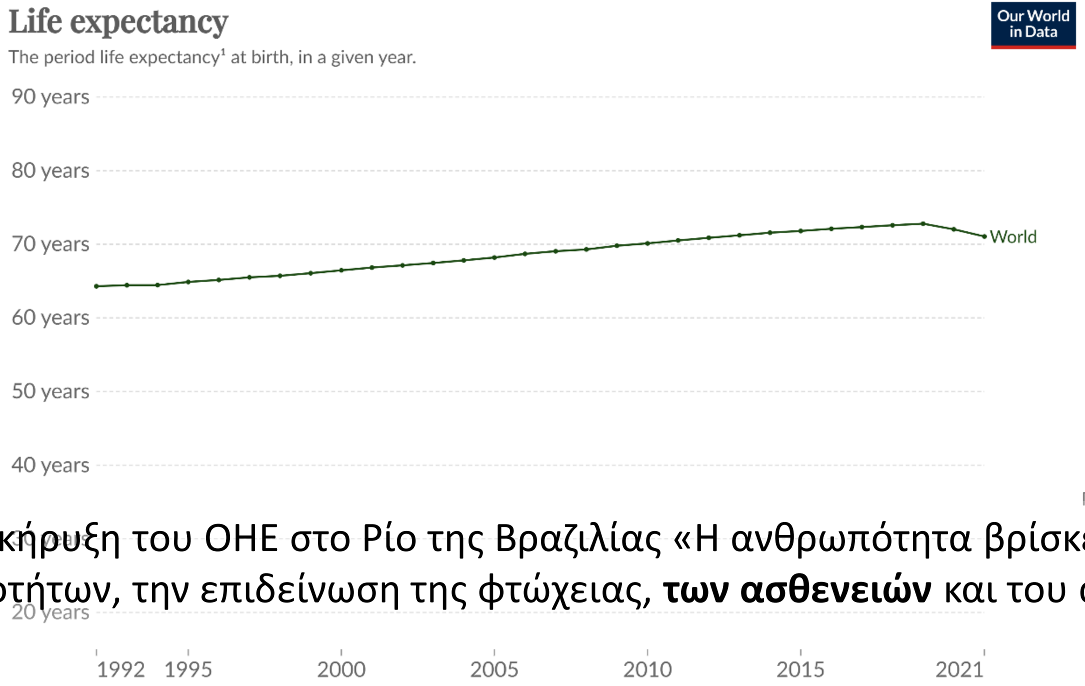




1992 Διακήρυξη του ΟΗΕ στο Ρίο της Βραζιλίας «Η ανθρωπότητα βρίσκεται αντιμέτωπη με την διαιώνιση των ανισοτήτων, **την επιδείνωση της φτώχειας**, των ασθενειών και του αναλφαβητισμού».

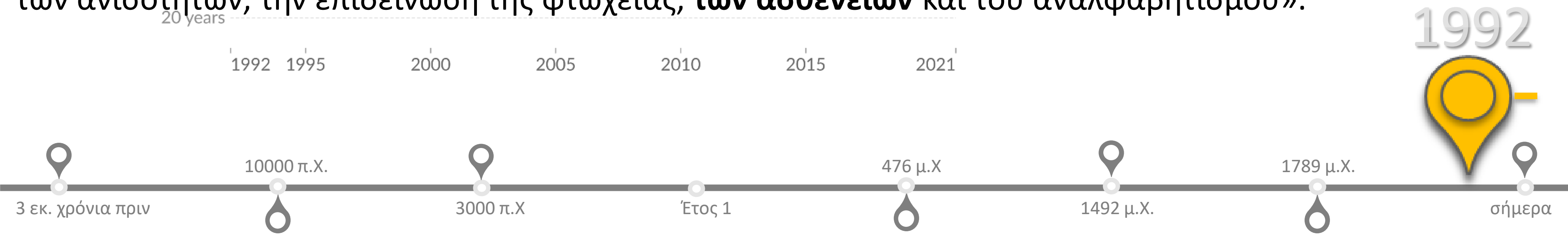
Πηγή: https://www.gapminder.org/fw/income-mountains/

Η αποτυχία της Μαλθουσιανής σκέψης

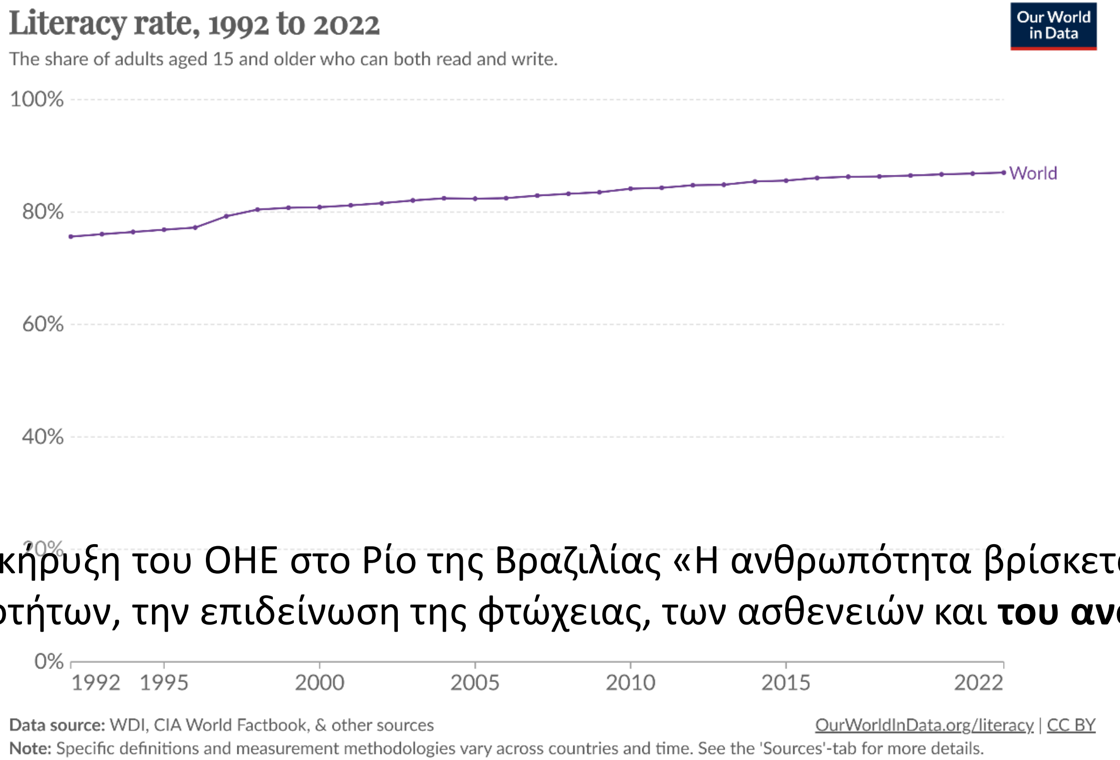


Πηγή: https://ourworldindata.org/grapher/life-expectancy

1992 Διακήρυξη του ΟΗΕ στο Ρίο της Βραζιλίας «Η ανθρωπότητα βρίσκεται αντιμέτωπη με την διαιώνιση των ανισοτήτων, την επιδείνωση της φτώχειας, **των ασθενειών** και του αναλφαβητισμού».

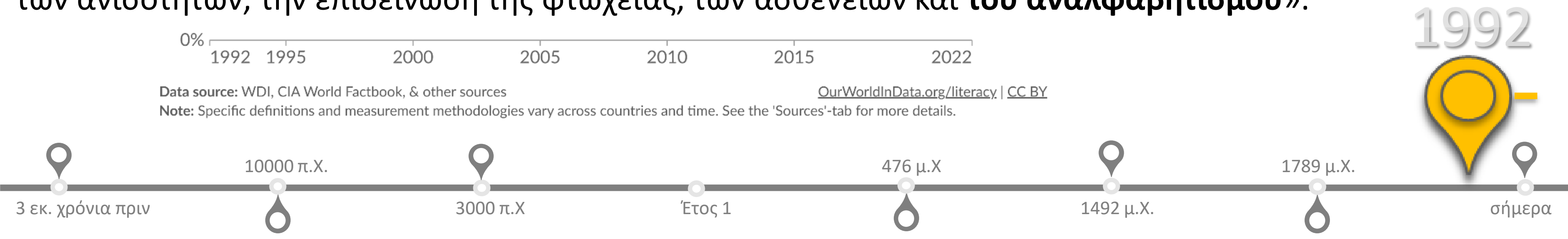


Η αποτυχία της Μαλθουσιανής σκέψης



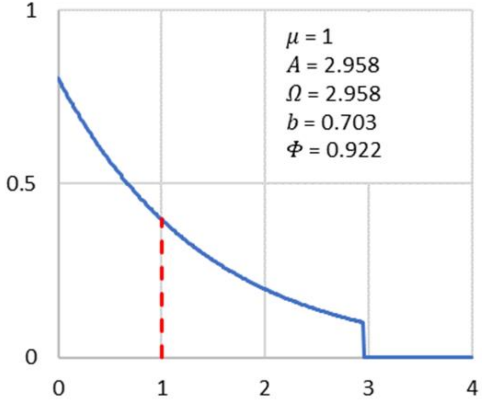
Πηγή: https://ourworldindata.org/grapher/cross-country-literacy-rates

1992 Διακήρυξη του ΟΗΕ στο Ρίο της Βραζιλίας «Η ανθρωπότητα βρίσκεται αντιμέτωπη με την διαιώνιση των ανισοτήτων, την επιδείνωση της φτώχειας, των ασθενειών και **του αναλφαβητισμού**».

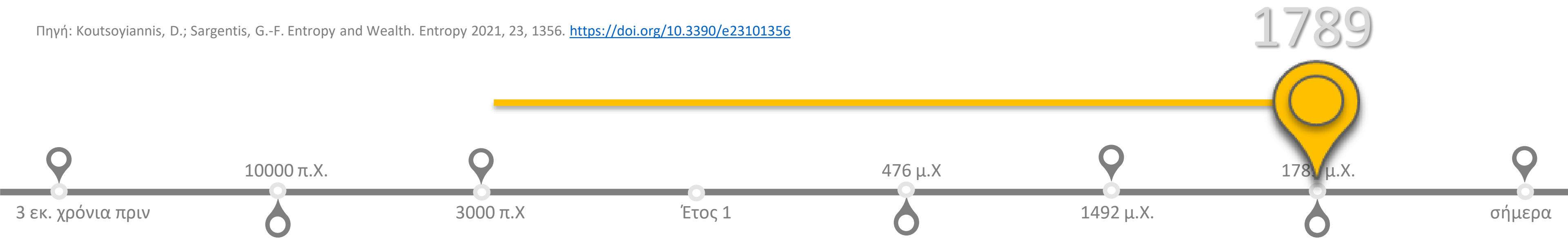


Τα αίτια των ανατροπών

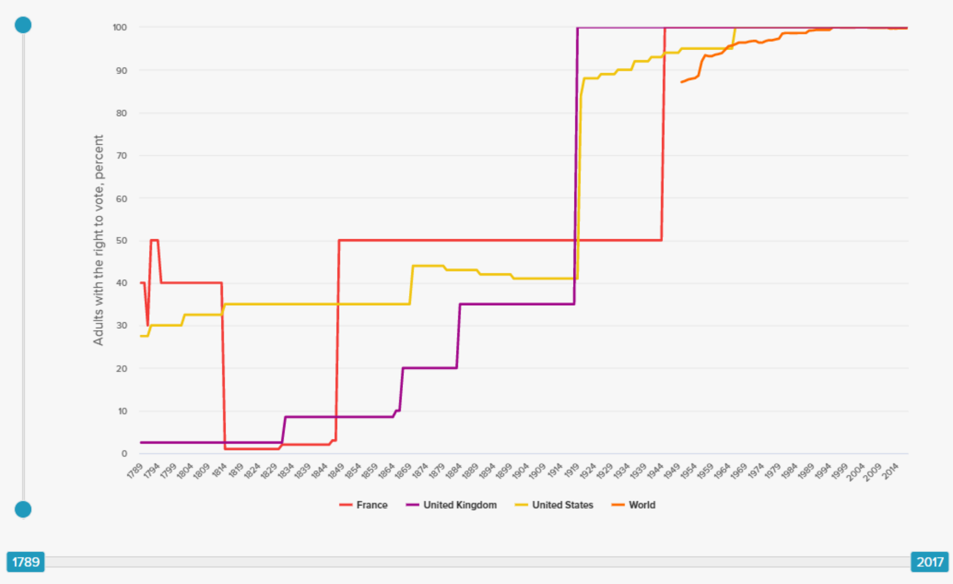
Entropy maximizing
probability density function



Πηγή: Koutsoyiannis, D.; Sargentis, G.-F. Entropy and Wealth. Entropy 2021, 23, 1356. https://doi.org/10.3390/e23101356



Τα αίτια των ανατροπών



Adults with the right to vote; percent, 1789–2017

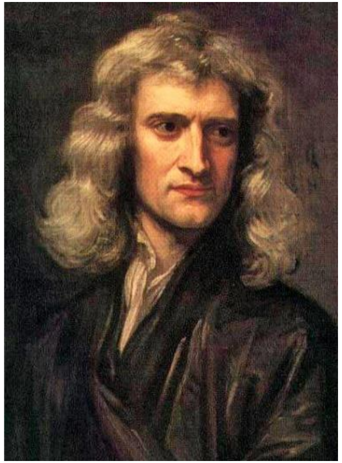
Πηγή:
https://www.humanprogress.org/dataset/adults-with-the-right-to-vote

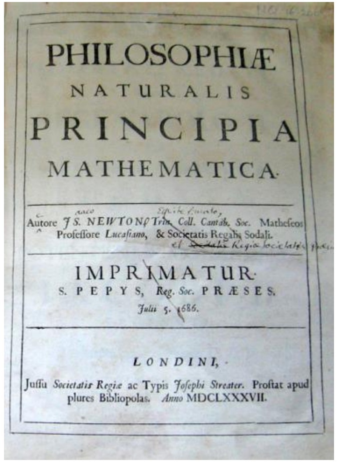
1789

3 εκ. χρόνια πριν
10000 π.Χ.
3000 π.Χ
Έτος 1
476 μ.Χ
1492 μ.Χ.
1789 μ.Χ.
σήμερα

Τα αίτια των ανατροπών

Galileo di Vincenzo Bonaulti de Galilei, 1564–1642





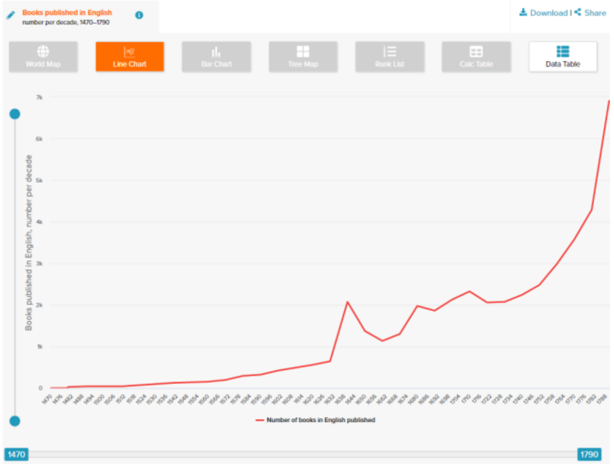
PHILOSOPHIÆ
NATURALIS
PRINCIPIA
MATHEMATICA.

Autore J S. NEWTONO, Trin. Coll. Cantab. Soc. Matheseos Professore Lucasiano, & Societatis Regalis Sodali.

IMPRIMATUR.
S. PEPYS, Reg. Soc. PRÆSES.
Julii 5. 1686.

LONDINI,
Jussu Societatis Regiæ ac Typis Josephi Streater. Prostat apud plures Bibliopolas. Anno MDCLXXXVII.

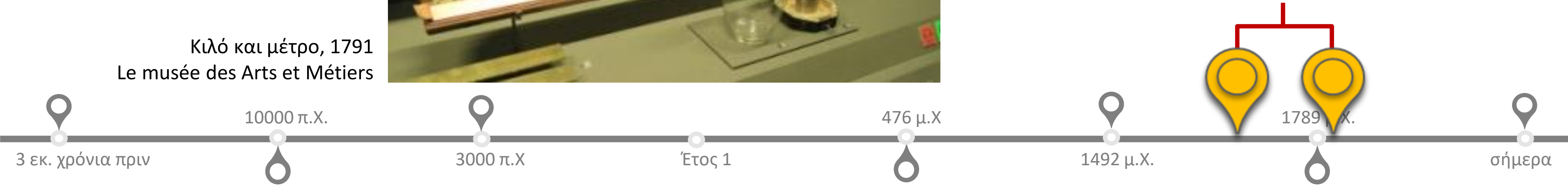
Sir Isaac Newton, 1642–1726



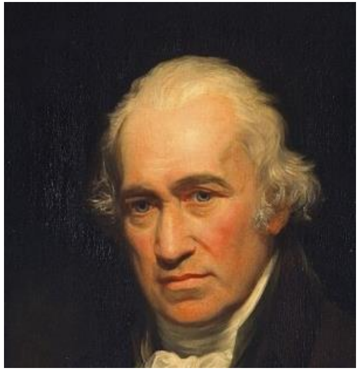
Books published in English
number per decade, 1470–1790
Πηγή: https://www.humanprogress.org/dataset/books-published-in-english/

Κιλό και μέτρο, 1791
Le musée des Arts et Métiers

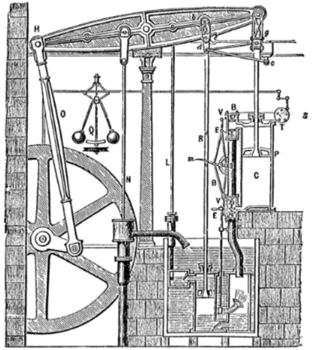
Επιστημονική επανάσταση 1600-1790

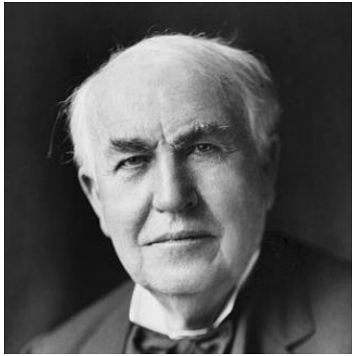


Τα αίτια των ανατροπών

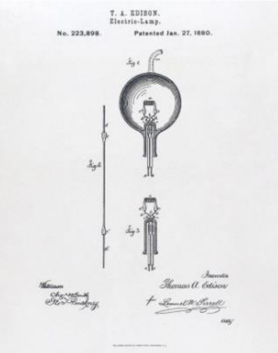


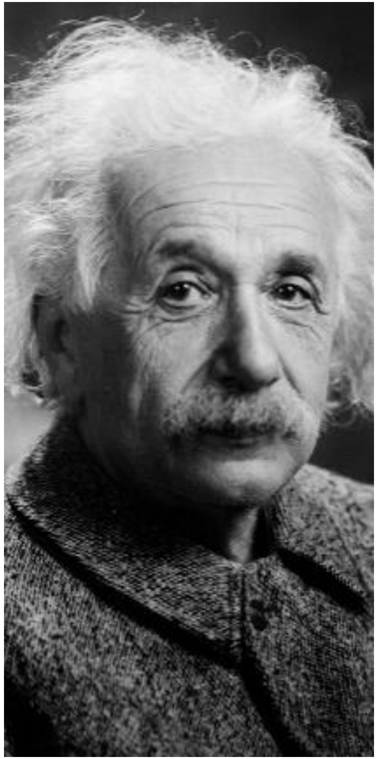
James Watt. 1736–1819





Thomas Alva Edison 1847–1931





Albert Einstein, 1879–1955

Ατομική-ηλεκτρονική εποχή 1935-

Ηλεκτρικός Αιώνας 1891-1934

Βιομηχανική επανάσταση 1791-1890

3 εκ. χρόνια πριν

10000 π.Χ.

3000 π.Χ

Έτος 1

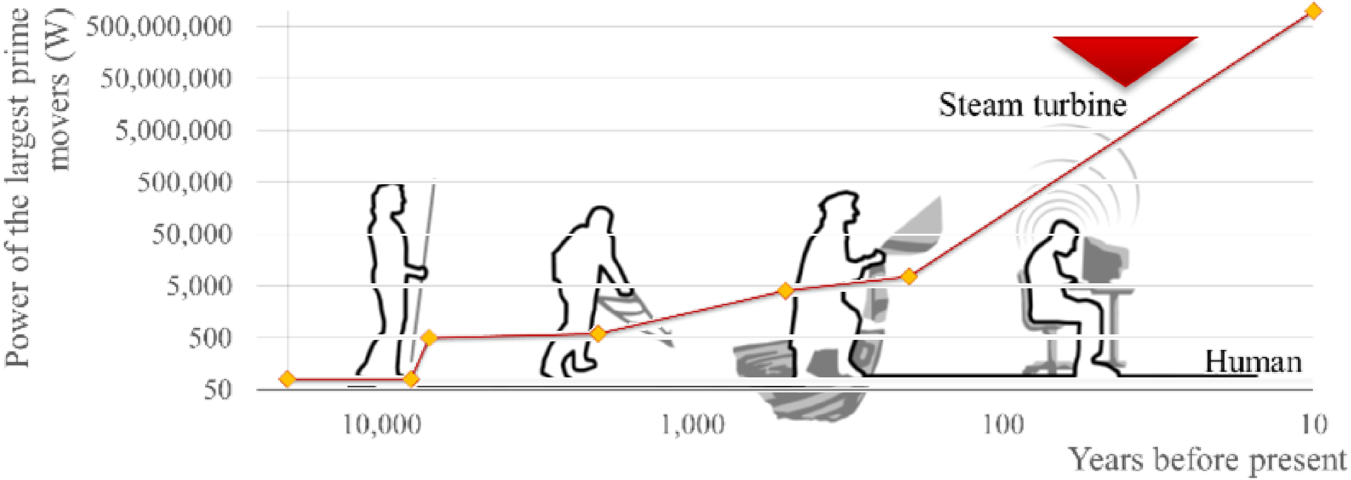
476 μ.Χ

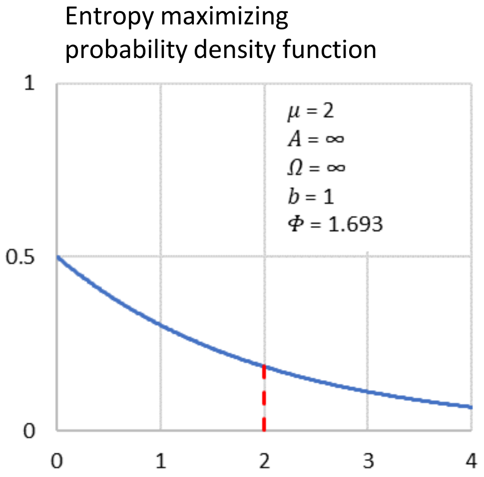
1492 μ.Χ.

1789 μ.Χ.

σήμερα

Τα αίτια των ανατροπών





Πηγή: Koutsoyiannis, D.; Sargentis, G.-F. Entropy and Wealth. Entropy 2021, 23, 1356. https://doi.org/10.3390/e23101356

1789

3 εκ. χρόνια πριν

10000 π.Χ.

3000 π.Χ

Έτος 1

476 μ.Χ

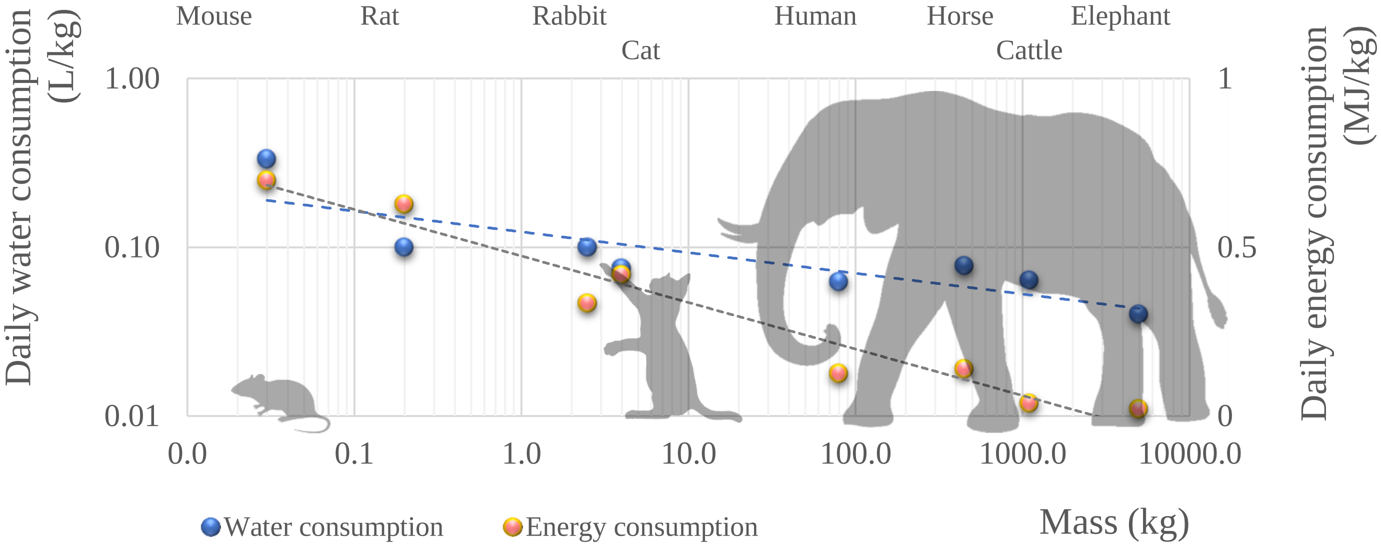
1492 μ.Χ.

1789 μ.Χ.

σήμερα

Τα αίτια των ανατροπών

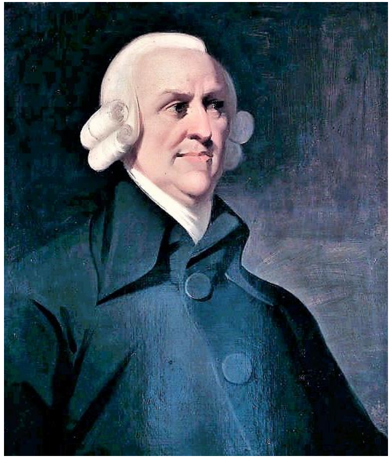
Οικονομίες κλίμακας: ο ρόλος τους στην Φύση

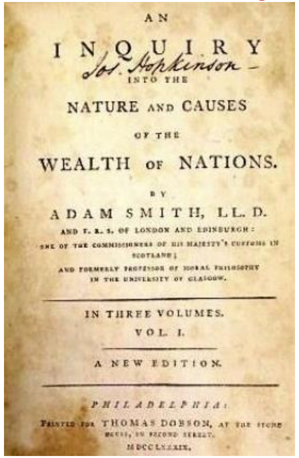


Κατανάλωση νερού και ενέργειας των θηλαστικών ανά μονάδα μάζας

Πηγή: Sargentis, G.F.; Lagaros, N.D.; Cascella, G.L.; Koutsoyiannis, D. Threats in Water–Energy–Food–Land Nexus by the 2022 Military and Economic Conflict. Land 2022, 11, 1569. https://doi.org/10.3390/land11091569

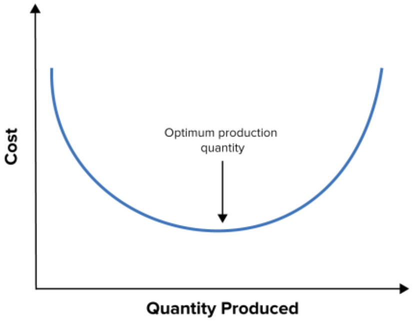
Τα αίτια των ανατροπών





AN
INQUIRY
Jos. Hopkinson
INTO THE
NATURE AND CAUSES
OF THE
WEALTH OF NATIONS.
BY
ADAM SMITH, LL. D.
AND F. R. S. OF LONDON AND EDINBURGH:
ONE OF THE COMMISSIONERS OF HIS MAJESTY'S CUSTOMS IN SCOTLAND;
AND FORMERLY PROFESSOR OF MORAL PHILOSOPHY IN THE UNIVERSITY OF GLASGOW.
IN THREE VOLUMES.
VOL. I.
A NEW EDITION.
PHILADELPHIA:
PRINTED FOR THOMAS DOBSON, AT THE STONE HOUSE, IN SECOND STREET.
MDCCLXXXIX.

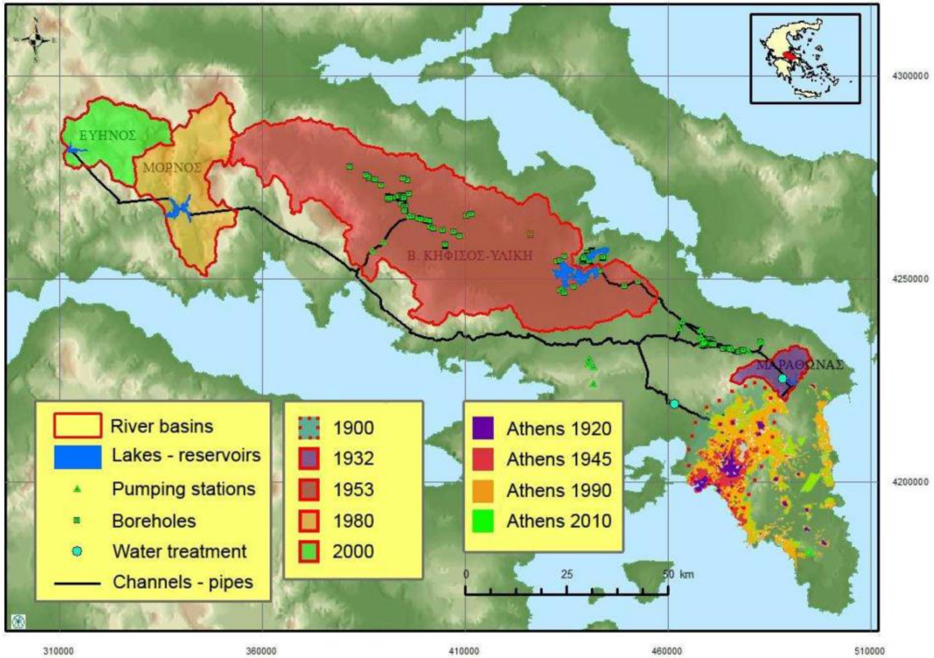
Smith, A. The Wealth of Nations, W. Strahan and T. Cadell, London 1776.

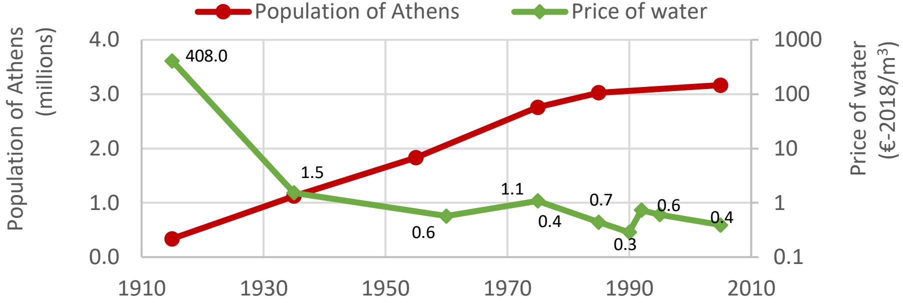


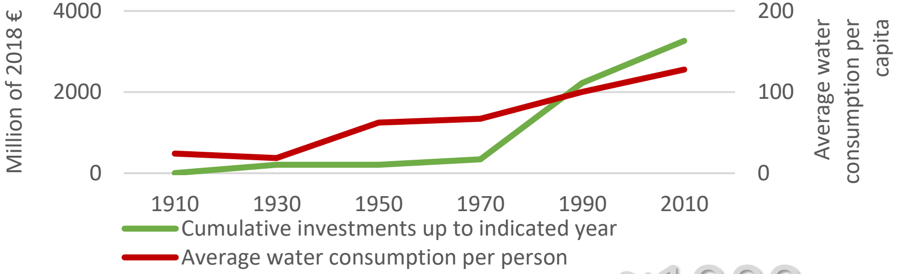
1776

3 εκ. χρόνια πριν
10000 π.Χ.
3000 π.Χ
Έτος 1
476 μ.Χ
1492 μ.Χ.
178 μ.Χ.
σήμερα

Τα αίτια των ανατροπών







~1900

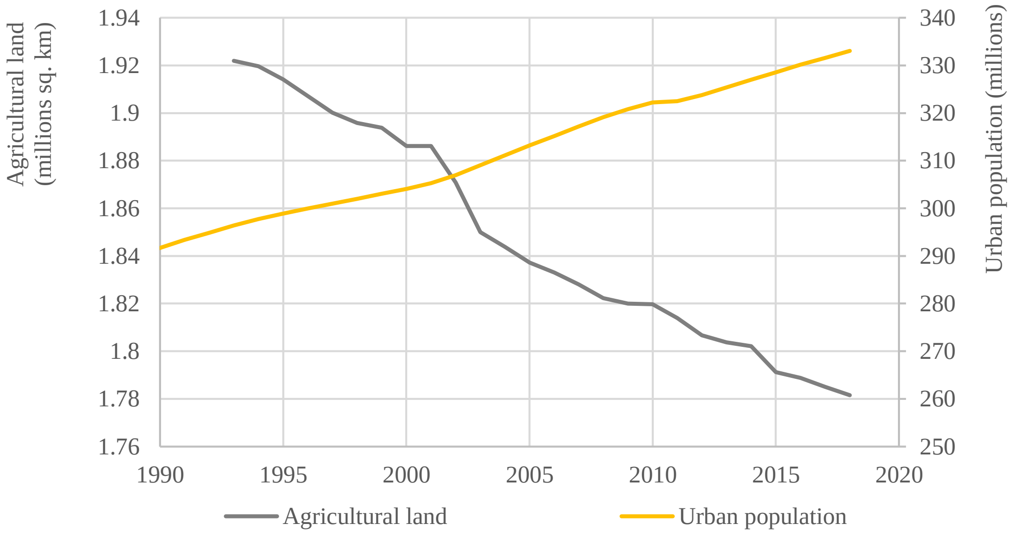
Πηγή: Sargentis, G.-F.; Ioannidis, R.; Karakatsanis, G.; Sigourou, S.; Lagaros, N.D.; Koutsoyiannis, D. The Development of the Athens Water Supply System and Inferences for Optimizing the Scale of Water Infrastructures. Sustainability 2019, 11, 2657. https://doi.org/10.3390/su11092657

Τα αίτια των ανατροπών

Ευρώπη: Νυχτερινές δορυφορικές φωτογραφίες

Πηγή: National Oceanic and Atmospheric Administration. National Centers for Environmental Information. Version 4 DMSP-OLS Nighttime Light Time Series. Available online: https://ngdc.noaa.gov/eog/dmsp/downloadV4composites.html

Πηγή: Sargentis, G.F.; Lagaros, N.D.; Cascella, G.L.; Koutsoyiannis, D. Threats in Water–Energy–Food–Land Nexus by the 2022 Military and Economic Conflict. Land 2022, 11, 1569. https://doi.org/10.3390/land11091569



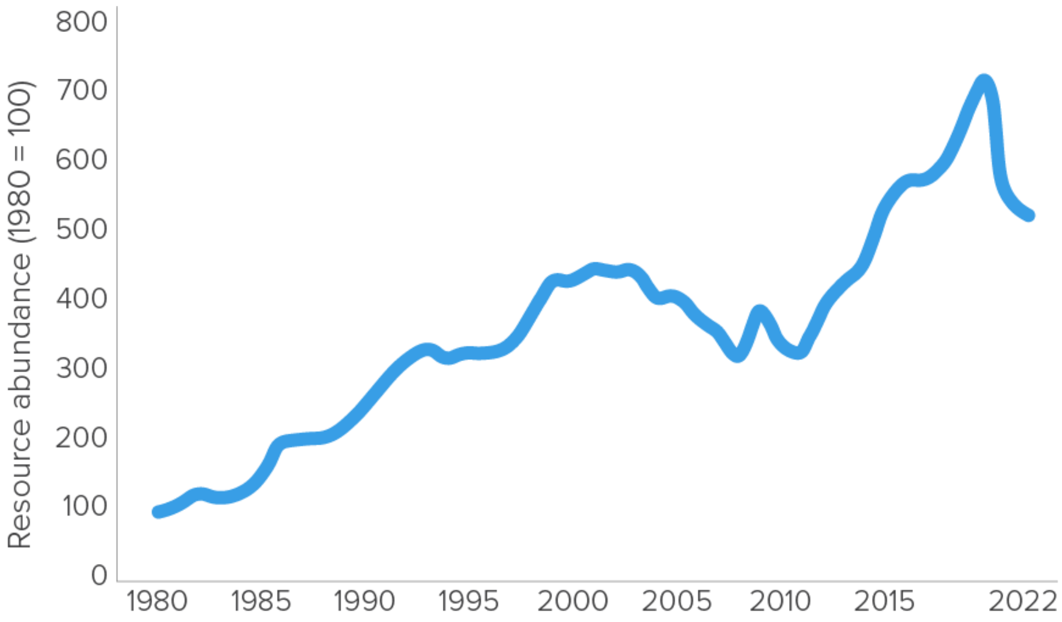
Ευρώπη: Αγροτική γη και αστικοποίηση

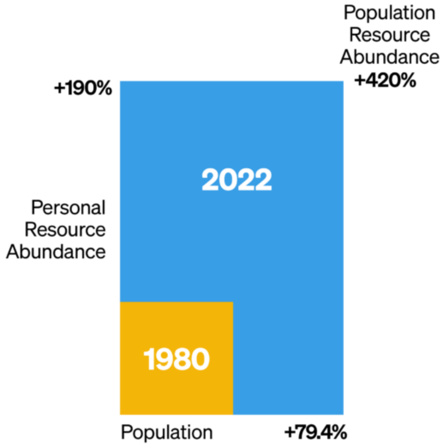
1992

3 εκ. χρόνια πριν · 10000 π.Χ. · 3000 π.Χ · Έτος 1 · 476 μ.Χ · 1492 μ.Χ. · 1789 μ.Χ. · σήμερα

Τα αίτια των ανατροπών

Πηγή: https://www.humanprogress.org/the-simon-abundance-index-2023/



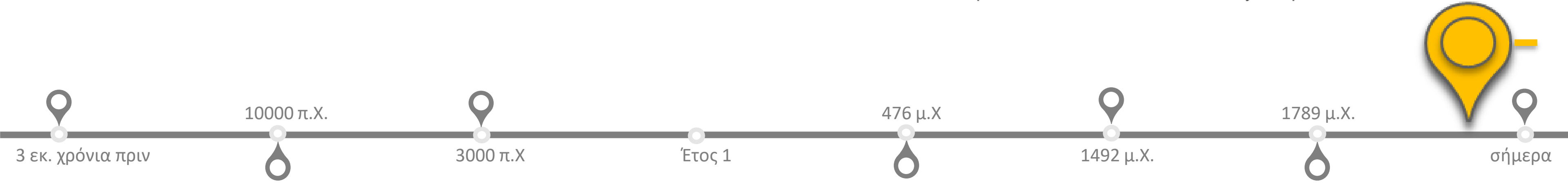


Basic 50

GDP per Total Hours Worked

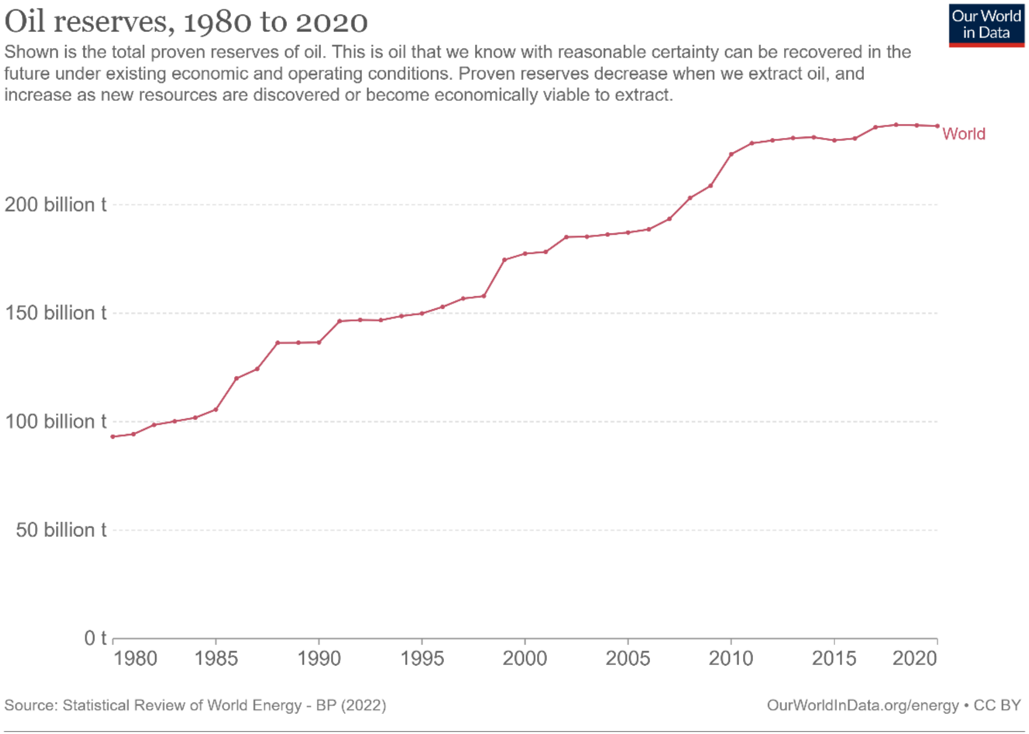
Compound Annual Growth Rate - Population Resource Abundance: **4.0%**
Years to Double - Population Resource Abundance: **17.65**
Personal Resource Abundance Elasticity of Population: **2.39**
Population Resource Abundance Elasticity of Population: **5.29**

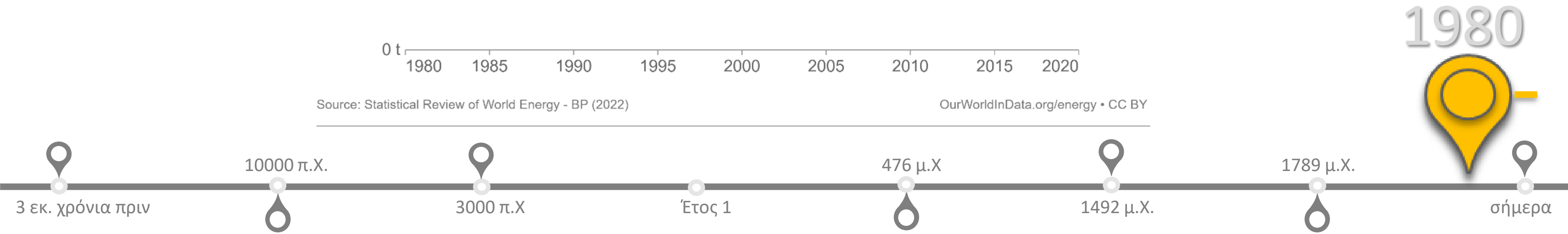
1980



Τα αίτια των ανατροπών

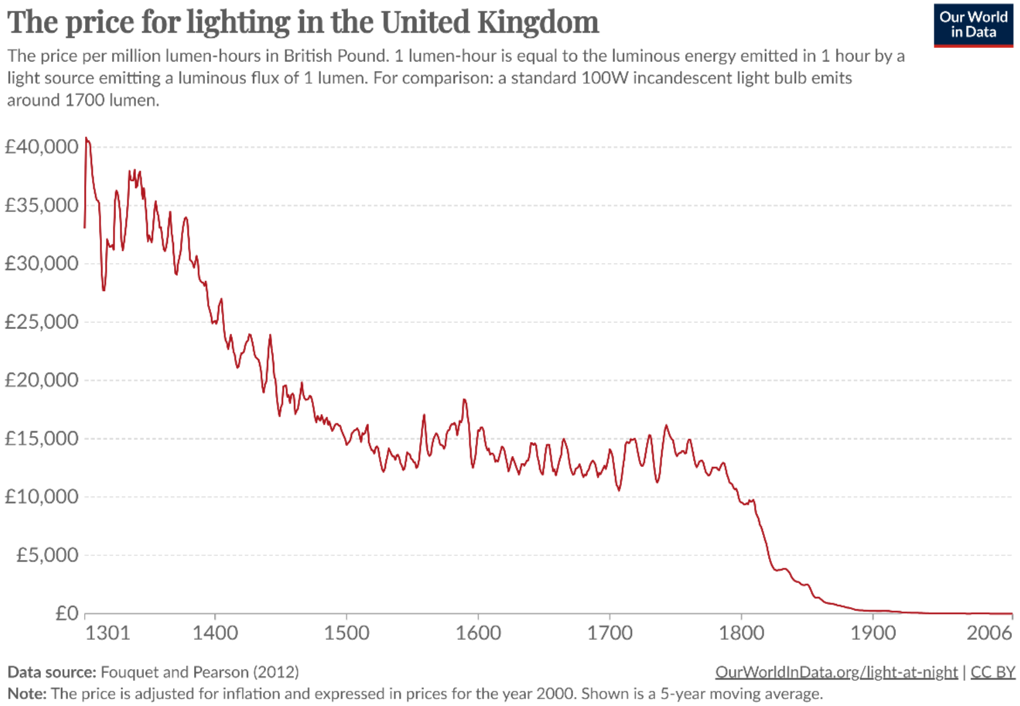
Πηγή: https://ourworldindata.org/grapher/oil-proved-reserves?tab=chart&time=earliest..2020/





Τα αίτια των ανατροπών

Πηγή: https://ourworldindata.org/grapher/the-price-for-lighting-per-million-lumen-hours-in-the-uk-in-british-pound



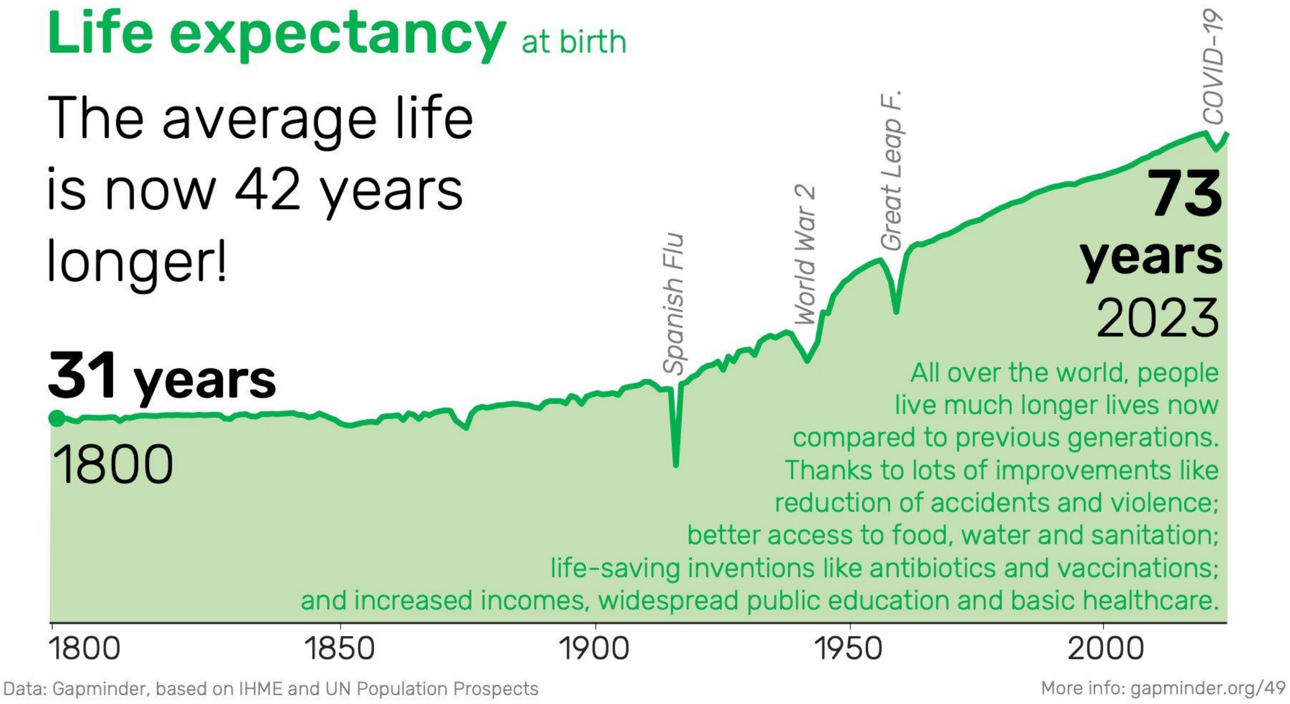
1301

10000 π.Χ. | 476 μ.Χ | 1789 μ.Χ.

3 εκ. χρόνια πριν | 3000 π.Χ | Έτος 1 | 1492 μ.Χ. | σήμερα

Τα αίτια των ανατροπών

Πηγή: https://www.gapminder.org/facts/life-expectancy-increased/



1800

3 εκ. χρόνια πριν | 10000 π.Χ. | 3000 π.Χ | Έτος 1 | 476 μ.Χ | 1492 μ.Χ. | 1789 μ.Χ. | σήμερα

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Taro Aso says he would refuse end-of-life care and would 'feel bad' knowing treatment was paid for by government

Πηγή: https://www.theguardian.com/world/2013/jan/22/elderly-hurry-up-die-japanese

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By Yaron Steinbuch

February 13, 2023 | 12:49pm | Updated

Πηγή: https://nypost.com/2023/02/13/yale-professor-suggests-elderly-japanese-residents-should-die-in-mass-suicide/

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Don Pittis · CBC News · Posted: Mar 26, 2020 4:00 AM EDT | Last Updated: March 26, 2020

Πηγή: https://www.cbc.ca/news/business/coronavirus-covid-economy-seniors-1.5510079

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Πηγή: https://www.un.org/en/desa/population-growth-environmental-degradation-and-climate-change

10000 π.Χ. | 476 μ.Χ | 1789 μ.Χ.

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Πηγή: https://www.independent.co.uk/climate-change/news/fsa-population-decline-climate-change-b1934877.html

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Give this article

By Dan Bilefsky and Christopher F. Schuetze

Oct. 13, 2016

Πηγή: https://www.nytimes.com/2016/10/14/world/europe/dutch-law-would-allow-euthanasia-for-healthy-elderly-people.html

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PLOS ONE

RESEARCH ARTICLE

Measurements of methane and nitrous oxide in human breath and the development of UK scale emissions

Ben Dawson[1,2], **Julia Drewer**[1], **Toby Roberts**[1], **Peter Levy**[1], **Mathew Heal**[2], **Nicholas Cowan**[1*]

1 UK Centre for Ecology and Hydrology, Bush Estate, Midlothian, United Kingdom, 2 The University of Edinburgh, School of Chemistry, Edinburgh, United Kingdom

* nicwan11@ceh.ac.uk

Check for updates

Citation: Dawson B, Drewer J, Roberts T, Levy P, Heal M, Cowan N (2023) Measurements of methane and nitrous oxide in human breath and the development of UK scale emissions. PLoS ONE 18(12): e0295157. https://doi.org/10.1371/journal.pone.0295157

Editor: Dafeng Hui, Tennessee State University, UNITED STATES

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Data Availability Statement: The data that support the findings of this study can be found in the Supporting Information files.

Funding: The analysis was funded by the UK NERC grant E/S003614/2 'Detection and Attribution of Regional greenhouse gas Emissions in the UK (DAREUK)'. We acknowledge contribution from UKSCAPE Programme, funded by the Natural Environment Research Council as National Capability (award number NE/R016429/1). The funders had no role in study design, data collection

Abstract

Exhaled human breath can contain small, elevated concentrations of methane (CH_4) and nitrous oxide (N_2O), both of which contribute to global warming. These emissions from humans are not well understood and are rarely quantified in global greenhouse gas inventories. This study investigated emissions of CH_4 and N_2O in human breath from 104 volunteers in the UK population, to better understand what drives these emissions and to quantify national-scale estimates. A total of 328 breath samples were collected, and age, sex, dietary preference, and smoking habits were recorded for every participant. The percentage of methane producers (MPs) identified in this study was 31%. The percentage of MPs was higher in older age groups with 25% of people under the age of 30 classified as MPs compared to 40% in the 30+ age group. Females (38%) were more likely to be MPs than males (25%), though overall concentrations emitted from both MP groups were similar. All participants were found to emit N_2O in breath, though none of the factors investigated explained the differences in emissions. Dietary preference was not found to affect CH_4 or N_2O emissions from breath in this study. We estimate a total emission of 1.04 (0.86–1.40) Gg of CH_4 and 0.069 (0.066–0.072) Gg of N_2O in human breath annually in the UK, the equivalent of 53.9 (47.8–60.0) Gg of CO_2. In terms of magnitude, these values are approximately 0.05% and 0.1% of the total emissions of CH_4 and N_2O reported in the UK national greenhouse gas inventories.

Introduction

It has been reported that exhaled human breath can contain the greenhouse gases methane (CH_4) and nitrous oxide (N_2O) [1, 2], both of which have a much higher global warming potential than carbon dioxide (CO_2) (34 and 265 for CH_4 and N_2O, respectively [3]). Where hydrocarbon chains (food types) are consumed by humans and turned into CH_4 (and N_2O from nitrogen intake), the global warming potential is no longer neutral, and human respiration has a net warming effect on the atmosphere. Due to their ruminant digestive system in

Πηγή: https://doi.org/10.1371/journal.pone.0295157

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Now scientists say BREATHING is bad for the environment: Gases we exhale contribute to 0.1% of the UK's greenhouse gas emissions

- Two greenhouse gases - both more potent than CO2 - are in human breath
- One is methane which is famously also emitted from livestock such as cows

By JONATHAN CHADWICK FOR MAILONLINE

PUBLISHED: 19:00 GMT, 13 December 2023 | **UPDATED:** 19:00 GMT, 13 December 2023

Πηγή: https://www.dailymail.co.uk/sciencetech/article-12859057/Now-scientists-say-BREATHING-bad-environment-Gases-exhale-contribute-0-1-UKs-greenhouse-gas-emissions.html

3 εκ. χρόνια πριν — 10000 π.Χ. — 3000 π.Χ — Έτος 1 — 476 μ.Χ — 1492 μ.Χ. — 1789 μ.Χ. — σήμερα

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Πηγή: https://www.humanprogress.org/how-anti-humanism-is-gaining-ground/

3 εκ. χρόνια πριν
10000 π.Χ.
3000 π.Χ
Έτος 1
476 μ.Χ
1492 μ.Χ.
1789 μ.Χ.
σήμερα